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9 UNITED STATES DISTRICT COURT
10 FOR THE NORTHERN DISTRICT OF CALIFORNIA
11 AT SAN FRANCISCO

12 FOOD & WATER WATCH, et al.,
13 Plaintiffs,
14 vs.
15 U.S. ENVIRONMENTAL PROTECTION
16 AGENCY, et al.
17 Defendants.

Civ. No. 17-CV-02162-EMC

**DECLARATION OF
BRUCE LANPHEAR, MD, MPH**

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1 I, Bruce Lanphear, MD, MPH, declare that:

2 1. I am a Clinical Investigator at the BC Children’s Hospital Research Institute, BC
3 Children’s Hospital, and Professor in the Faculty of Health Sciences at Simon Fraser University in
4 Vancouver, British Columbia.

5 2. I am also the Co-Principal Investigator of an ongoing study to examine the impact of early-
6 life fluoride exposures on intellectual abilities in a cohort of mothers and offspring from Canada known
7 as the MIREC Study. Our study of fluoride and IQ in the MIREC cohort was funded by a grant from the
8 U.S. National Institutes of Health (NIH).

9
10 **I. SUMMARY OF QUALIFICATIONS**

11 3. A complete summary of my qualifications and publications can be found in my Curriculum
12 Vitae, which has been marked as Plaintiffs’ Exhibit 6 and attached herein.

13 4. I have studied the impact of toxic chemicals, including lead and pesticides, on children’s
14 brain development for over 20 years. My research has been almost exclusively funded by federal agencies,
15 including the Environmental Protection Agency (EPA), Centers for Disease Control and Prevention, the
16 Department of Housing and Urban Development, Health Canada, National Institute of Allergy and
17 Infectious Diseases, National Institute for Child Health and Human Development, National Institute of
18 Environmental Health Sciences, National Institute of Neurologic Diseases, and the National Heart, Lung
19 and Blood Institute.

20
21 5. My research has been published in leading medical and scientific journals, including
22 *Journal of the American Medical Association*, *New England Journal of Medicine*, and *Pediatrics*, and has
23 been extensively relied upon by environmental and public health agencies, including the EPA. My pooled
24 analysis of blood lead and IQ (Lanphear 2005) was cited by the EPA as the critical study upon which the
25 Agency based the current national air standard for lead.
26

1 6. I have served on the editorial boards of seven academic journals, including *Public Health*
2 *Reports* (the official journal of the U.S. Surgeon General), *PLoS Medicine* (a peer-reviewed medical
3 journal published by the Public Library of Science), and *Environmental Health Perspectives* (a journal
4 funded by the National Institutes of Environmental Health Sciences).

5 7. I have served on numerous scientific committees on environmental health issues impacting
6 children, including multiple scientific advisory boards for the EPA and the Executive Council on
7 Environmental Health for the American Academy of Pediatrics. My work with the EPA has included
8 invited expert advisory roles on EPA's (i) Science and Research Work Group of the Children's Health
9 Protection Advisory Committee (1998-2001); (ii) Workshop on Assessing Environmental Exposures to
10 Children (2000-2002); (iii) Clean Air Scientific Advisory Committee (2006-2008); (iv) Science Advisory
11 Board for Evaluating Dust Lead Standards (2010-2012); and (v) Science Advisory Board for Evaluating
12 Hazards of Partial Water Line Replacement (2011-2012).

13 8. My research has earned various awards and honors, including the Research Integrity Award
14 from the International Society for Environmental Epidemiology in 2012, the Public Policy and Advocacy
15 Award from the Academic Pediatric Association in 2013, and the Research Award from the Academic
16 Pediatric Association in 2015.

17 9. I have been involved with the MIREC Study for over 10 years. I was a Co-Principal
18 Investigator for the neurobehavioral assessments conducted when the children were 3 to 4 years old and I
19 oversaw the neurodevelopmental assessments in Vancouver. I have been a coauthor of twelve publications
20 from the MIREC Study, including three publications on fluoride described below.

21 10. In light of the consistent association between elevated fluoride and IQ reported in cross-
22 sectional studies (Choi, et al. 2012), we received a grant from the NIH to study the association between
23 prenatal and early-life measures of fluoride and IQ in children in the MIREC cohort. To date, we have
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1 published three peer-reviewed studies, including the most extensive assessment of fluoride exposure
2 during pregnancy ever conducted and prospective studies on early life fluoride exposure on IQ. These
3 studies have been published in *Environmental Health Perspectives*, *JAMA Pediatrics*, and *Environment*
4 *International* (Till 2018, Green 2019, Till 2020). Our study on prenatal fluoride and IQ was the highest
5 scoring study in *JAMA Pediatrics* in 2019 (Christakis 2020).

6 11. I agreed to participate as a non-retained expert in this case because I believe it is a public
7 duty to present the results of studies that suggest substantial risk to public health. I have asked *not* to be
8 compensated for this work.

9
10 **II. SUMMARY OF OPINIONS**

11 12. Our study of prenatal fluoride and IQ in the MIREC cohort (Green 2019) further enhances
12 the quality of data related to the neurotoxicity of fluoride. As with the ELEMENT cohort, we employed a
13 prospective cohort design, had extensive control for potential confounders, and had multiple measures of
14 fluoride exposure during pregnancy, including three types of urinary fluoride measurements for each
15 trimester of pregnancy.

16 13. The maternal urinary fluoride levels in the MIREC cohort were significantly associated
17 with lower intellectual abilities in 3-4-year-old children. These associations remain large and significant
18 when controlling for relevant covariates.

19 14. Converging results from the MIREC and ELEMENT cohorts indicate that exposure to
20 “optimal” levels of fluoride during fetal development is associated with diminished intelligence in
21 childhood.

22 15. In the MIREC cohort, exposure to fluoridated water in infancy, particularly among
23 formula-fed infants, was also associated with diminished intelligence (Till 2020). This association remains
24 significant after controlling for fetal fluoride exposure and other relevant covariates, suggesting that
25
26
27

1 susceptibility to fluoride's adverse neurological effects may extend into infancy.

2 **III. BASIS FOR OPINIONS**

3 **A. The Growing Problem with Brain-Based Disorders**

4 16. As I have discussed elsewhere, the causes of death and disability in children have shifted
5 over the past century (Lanphear 2015). Concerted public health efforts to control tuberculosis, cholera,
6 typhoid, and other infectious agents in the early twentieth century led to a dramatic reduction in child
7 mortality, followed by a rise in life expectancy. By the end of the twentieth century, the 'new morbidities
8 of childhood' had emerged: attention deficit hyperactivity disorder (ADHD), autism, asthma, obesity, and
9 preterm birth. Learning disabilities and neurodevelopmental disorders are now two of the most prevalent
10 morbidities in children. About 7.6% of US children are estimated to have a learning disability, and 13%
11 are estimated to have a neurodevelopmental disorder, including anxiety, autism, conduct disorder,
12 depression, or ADHD (Lanphear 2015). These data indicate that we are in the midst of an epidemic of
13 brain-based disorders.
14

15 17. Neurotoxicants can have a lifelong impact on brain function. Children who have higher
16 blood lead concentrations, for example, may never meet the same peak cognitive ability in adulthood as
17 that in less exposed children. At the other end of the age spectrum, cognitive decline is accelerated in
18 adults who have higher bone lead concentrations and some evidence has shown that lead exposure is a
19 risk factor for the development of late-onset Alzheimer's disease. Few birth cohorts have been studied
20 into adulthood; however, it would be surprising if the effects of other neurotoxicants observed in school-
21 aged children do not persist into adulthood (Lanphear 2015). The cumulative impact of exposures to
22 various toxins that only modestly impact intellectual abilities can be substantial (Lanphear 2015).
23

24 18. The high reported prevalence of learning disabilities and neurodevelopmental disorders has
25 fueled research to better understand the role of environmental chemicals, including the use of prospective
26

1 cohort studies that collect individualized biomarkers of exposure to environmental toxins. Biologic
2 markers, or biomarkers, of exposure, which can enhance our ability to quantify an individual's internal
3 dose of a contaminant, are revolutionizing the study of environmental toxins in the same way genetic tests
4 are revolutionizing the study of heritability (Lanphear 2015).

5 **B. The MIREC Cohort Is a Comprehensively Characterized Birth Cohort**

6 19. The MIREC¹ cohort in Canada was developed to obtain biomonitoring data for pregnant
7 women and their infants to examine potential adverse health effects of early-life exposure to
8 environmental chemicals.

9 20. The MIREC cohort is a geographically diverse and comprehensively characterized birth
10 cohort. Women were recruited during the first trimester of pregnancy from 10 cities across Canada,
11 including cities that add fluoride to water for caries prevention purposes (e.g., Toronto), and cities that do
12 not (e.g., Vancouver). Women were followed through delivery and their offspring have undergone
13 periodic neurodevelopmental tests, including IQ testing.

14 21. We administered questionnaires during pregnancy and early childhood to collect
15 information on demographics, occupation, lifestyle, medical history, environmental exposures and diet.
16 Dietary questions included whether the mother drank tap water during pregnancy, how many glasses of
17 water and other beverages she consumed, and duration of breastfeeding.

18 22. Information on the pregnancy and the infant was abstracted from medical charts. Maternal
19 urine was collected at multiple points throughout pregnancy, as was blood, urine, hair, breast milk, cord
20 blood and infant meconium. These samples have been archived in a biobank.

21 23. Study staff from each participating study site completed a 3-day training session that was
22
23

24
25
26 ¹ MIREC stands for Maternal-Infant Research on Environmental Chemicals. It is an
27 interdisciplinary collaboration between Health Canada scientists and clinical and academic researchers,
28 and was funded by Health Canada, the Ontario Ministry of the Environment, and a grant from the
Canadian Institutes of Health Research.

1 led by a PhD-level psychologist and focused on specialized training of the neurodevelopmental tests. The
2 training emphasized the importance of providing an ideal and standardized environment in the home by
3 ensuring that the test area was well-lit, quiet, and free from distractions and interruptions.

4 **C. Urinary Fluoride Study (Till 2018)**

5 24. In 2018, we published the most comprehensive study of urinary fluoride during pregnancy
6 that has ever been conducted (Till 2018). Our study included 1,566 pregnant women from the MIREC
7 cohort who had urine samples for each trimester of pregnancy. It was the first study of its kind in water-
8 fluoridated areas of North America. A similar study has recently been published of a smaller pregnancy
9 cohort in California (Uyghurturk 2020), but our study remains the largest and most thorough.
10

11 **1. Methodological Strengths**

12 25. Our study of urinary fluoride was conducted in accordance with sound and objective
13 science practices. Important strengths of the study include: (1) a large study size, with over 1,500 women
14 and over 5,000 urine samples; (2) collection of urine samples from each trimester for each mother; (3)
15 empirical data on the actual measured water fluoride levels for each mother's water treatment plant
16 boundary (WTP) during the course of the pregnancy; (4) control for other factors that have potential to
17 influence urinary fluoride excretion, including tea consumption, alcohol use, pre-pregnancy BMI,
18 maternal age, maternal education, annual household income, and race; (5) control for fluctuations that can
19 occur in urine fluoride during the day by adjusting for dilution using two methods (specific gravity and
20 creatinine) and controlling for time of void and time since last void; and (6) measurement of fluoride in
21 urine using the same scientist (Dr. Martinez-Mier), method (microdiffusion), and laboratory (University
22 of Indiana) as the ELEMENT cohort, thereby enhancing the comparability of the data.
23

24 26. Dr. Martinez-Mier's lab at the University of Indiana is considered a gold-standard lab for
25 the testing of fluoride in urine and blood. EPA appears to recognize Dr. Martinez-Mier's expertise as she
26

1 was approached by EPA to serve as an expert in this case.

2 **2. Fluoridated Water Has a Large and Significant Effect on Urinary**
3 **Fluoride**

4 27. In our study, fluoride in water had the strongest correlation with urine fluoride of all the
5 factors that we measured, thus confirming that fluoridated water remains a major source of fluoride intake
6 (Till, 2018).

7 28. The average urinary fluoride level among pregnant women in fluoridated areas is almost
8 two times higher than the average levels in nonfluoridated areas (Till 2018).

9 29. The average creatinine-adjusted² maternal urinary fluoride level in the fluoridated areas is
10 0.87 mg/L, versus 0.46 mg/L in the non-fluoridated areas.³

11 30. Our data suggests that, for every 0.5 mg/L increase in water fluoride level, urinary fluoride
12 levels will increase by 74-82%.

13 31. Our findings are consistent with prior studies showing that, among adults, fluoride levels
14 in urine are closely correlated with the concentration of fluoride in water.

15 32. As part of our study, we attached a table showing the full distribution of urinary fluoride
16 levels, including the 75th and 95th percentile exposures for each trimester (Till et al. 2018, Table S4). At
17 the second trimester, 95th percentile values in the fluoridated areas were 2 mg/L (adjusted for creatinine),
18 and 1.63 mg/L (adjusted for specific gravity).
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24 ² Creatinine-adjustment of spot urine samples adjusts for dilution and has been found to have good
25 agreement with 24-hour fluoride values (WHO 2014, Zohouri 2006). We used the same method for
26 creatinine adjustment as Bashash (2017). We also adjusted for dilution by correcting for specific gravity.
Our adjustments for creatinine and specific gravity produced results that were highly correlated ($r = 0.91$)
and interchangeable in our analyses of the factors that increase urinary fluoride.

27 ³ The average specific gravity-adjusted concentration in the fluoridated areas was 0.71 mg/L (SD
0.38 mg/L), with a range of 0.10 to 3.12 mg/L.

1 was a known fetal abnormality, if they had any medical complications (i.e., cancer, renal disease,
2 cardiovascular disease), or if there was known maternal alcohol or drug abuse during pregnancy. For
3 analyses using water fluoride, we excluded women if they did not drink tap water during their pregnancy.
4 For those not excluded, we controlled for the following factors: maternal education; maternal age; quality
5 of the child's home environment (HOME); child sex; mother's race; city of residence; secondhand smoke;
6 maternal blood or urinary concentrations of other neurotoxicants, such as lead, arsenic, mercury,
7 manganese, and PFOA. Additionally, we controlled for the diurnal fluctuations that may occur in urinary
8 fluoride levels by including time of day that the urine sample was collected and time since last void.
9

10 39. ***Individualized Measures of Fluoride Exposure:*** Another important strength of our study
11 is that we had multiple individualized measures of prenatal fluoride exposure, including: (1) urinary
12 fluoride samples averaged across each trimester of pregnancy and corrected for urinary dilution; (2)
13 measured water fluoride levels from within each participant's water treatment plant boundary during the
14 course of their pregnancy;⁴ and (3) questionnaire data about how much water each woman drank from tap
15 water and water-based beverages.
16

17 40. ***Large, Multi-Center Cohort:*** Our study included 512 mother-offspring pairs which is a
18 robust sample size for statistical analyses. Further, the mother-offspring pairs came from 6 cities across
19 Canada, some of which fluoridate their water (average F = 0.59 mg/L), and some of which do not (average
20 F = 0.13 mg/L).⁵ Our study thus permitted us to examine the impact of fluoride exposures on IQ in
21 communities with water fluoridation, thus addressing what some have perceived to be a limitation of prior
22
23

24 ⁴ Water treatment plants measured fluoride levels daily if fluoride was added to municipal drinking
25 water and weekly or monthly if fluoride was not added to water. We matched participants' postal codes
26 by averaging water fluoride concentrations (in milligrams per liter) during the duration of pregnancy.

27 ⁵ Pregnant women in the fluoridated areas tended to have higher incomes and more education, which
28 may help explain the lack of difference in average *unadjusted* IQs between fluoridated and non-fluoridated
areas (Green 2019, Table 1).

1 studies of fluoride neurotoxicity.

2 41. **Reliable and Objective IQ Test:** We assessed children’s intellectual abilities with the
3 Wechsler Preschool and Primary Scale of Intelligence, Third Edition (WPPSI-III). This is a validated IQ
4 test with excellent internal reliability ($r = 0.96$), and good test-retest reliability ($r = 0.86$). We used Full
5 Scale IQ (FSIQ), which is a measure of global intellectual functioning, as the primary outcome. The FSIQ
6 score is comprised of two composite scores: Verbal IQ (VIQ)—representing verbal reasoning and
7 comprehension—and Performance IQ (PIQ)—representing nonverbal reasoning, spatial processing, and
8 visual-motor skills.

9 42. **Blinded Assessments:** As with the ELEMENT cohort, our study was “blinded,” meaning
10 the examiners were not aware of the mother’s fluoride exposure status at the time of the examination. This
11 eliminates the potential for examiner bias.

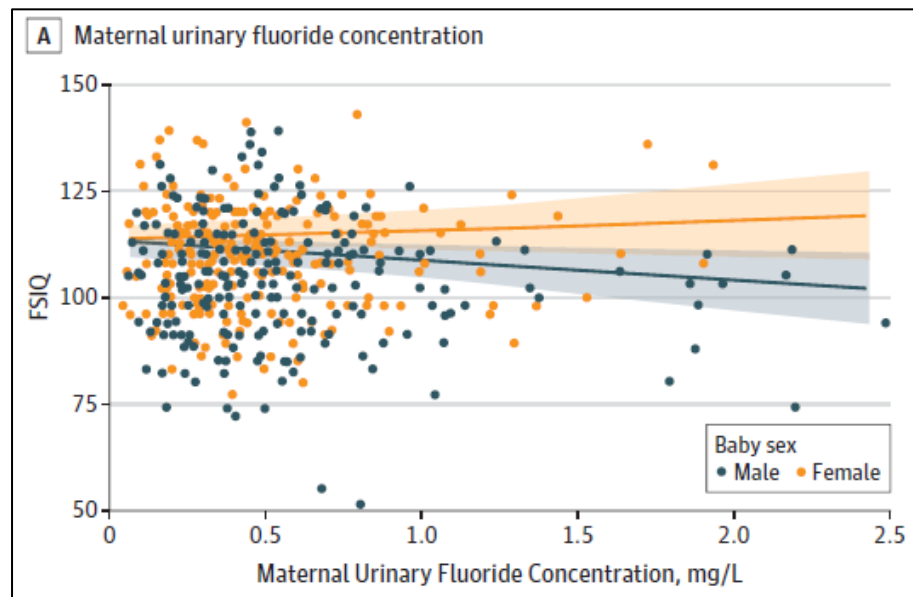
12 43. **Statistical Analyses that Did Not Assume Linearity:** We conducted sound, objective, and
13 rigorous statistical analyses that: (i) controlled for the impact of the large number of measured covariates;
14 (ii) examined the data for collinearity, outliers, and influential points; and (iii) scrutinized the shape of the
15 relationship between fluoride and IQ. With respect to linearity and possible threshold effects, we
16 conducted sensitivity analyses that used quadratic and natural log effect models as well as ran spline
17 analyses that examined the relationship below 0.5 mg/L, 0.8 mg/L, and 1.0 mg/L in urine (and below 0.4
18 mg/day and 0.8 mg/day in fluoride intake). We did *not* assume that statistical associations between fluoride
19 and IQ were linear and without threshold.

20 44. Short of intentionally dosing pregnant mothers with fluoride, we maximized the power of
21 environmental epidemiology to investigate whether prenatal fluoride exposure is associated with
22 neurocognitive deficits in a prospective, observational cohort study.
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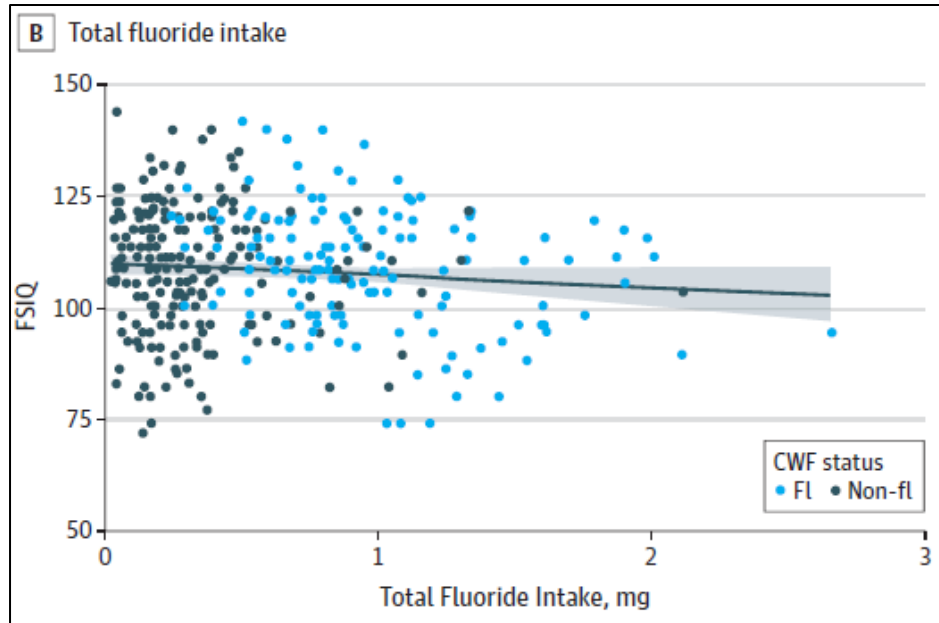
2. Prenatal Fluoride Exposure Is Associated with Large and Significant Reductions in IQ in the MIREC Cohort

45. All three measures of prenatal fluoride exposure—(i) maternal urinary fluoride, (ii) maternal fluoride intake from beverages, and (iii) water fluoride concentration during pregnancy—were associated with large, statistically significant decreases in IQ among the 3 to 4-year old children in the MIREC cohort.

46. After controlling for covariates, a 1-mg/L increase in maternal urinary fluoride⁶ was associated with a **4.49 lower IQ** score (in boys); a 1-mg higher daily intake of fluoride from beverages was associated with a **3.66 lower IQ** score (in boys and girls); and a 1 mg/L higher water fluoride concentration was associated with a **5.29 lower IQ** score (in boys and girls). These fluoride-associated reductions in IQ that we found showed a linear, dose-response relationship with no apparent indication of a threshold (see figures below).



⁶ We used specific gravity (SG) as the primary adjustment method for this study. The average SG-adjusted concentration among women from the fluoridated areas was 0.69 mg/L (SD = 0.42), which is consistent with the concentration in fluoridated areas from the larger cohort (0.71 mg/L, SD = 0.38) (Till 2018). Sensitivity analyses using the creatinine-adjusted urinary fluoride values did not change the results between fluoride and IQ (Green 2019, eTable 2).



12 47. The effect sizes that we found are large and rival the impact of a population blood lead
13 concentration of 5 $\mu\text{g}/\text{dL}$.⁷ Fourteen percent of the women had urinary fluoride concentrations exceeding
14 1.0 mg/L, and thus the impact for some children may exceed the ranges identified above.

15 48. Although maternal urinary fluoride was associated with significant reduction in full-scale
16 IQ in boys, it was not associated with diminished full-scale IQ in girls. As is often the case, the reason for
17 this discrepancy is not currently known. It is known, however, that boys have a higher prevalence of
18 neurodevelopmental disorders such as ADHD, learning disabilities, and intellectual disabilities than girls.
19 It is also known that boys and girls may respond differently to some neurotoxicants. In our studies of the
20 MIREC cohort, for example, we found that low levels of blood lead correlate with a loss of IQ in boys,
21 but not girls (Desrochers-Couture 2018).

22 49. The possibility that boys are more sensitive to prenatal fluoride exposure than girls is
23
24

25 ⁷ My pooled analysis of blood lead and IQ found that an increase in childhood blood lead from <1
26 to 10 $\mu\text{g}/\text{dL}$ was associated with a 6.9 IQ point decrement (Lanphear 2015, p. 814). General population
27 exposures to lead today are now on the low-to-mid range of this spectrum, with relatively few children
28 having blood lead levels as high as 10 $\mu\text{g}/\text{dL}$.

1 supported by at least one animal study, in which males had greater deficits from prenatal exposure and
2 females had greater deficits from postnatal exposure (Mullenix et al 1995). While we did not find sex-
3 specific differences with our other two exposure measures (water F concentration and water F intake),
4 these other measures may better correlate with chronic or postnatal exposure and thereby reflect distinct
5 risks.

6 **3. Convergent Findings of ELEMENT and MIREC Cohorts.**

7 50. The significant associations we observed between prenatal fluoride and IQ in the MIREC
8 cohort are consistent with the findings from the ELEMENT cohort (Bashash, 2017).
9

10 51. In the ELEMENT study, an increase of 1 mg/L in creatinine-adjusted maternal urine was
11 associated with a loss of 6.3 IQ points among 4-year olds, as measured by General Cognitive Index (GCI)
12 of the McCarthy Scales of Children's Abilities. In our analysis, an increase of 1 mg/L in creatinine-
13 adjusted maternal urine was associated with a loss of 4.96 IQ points among 3- to 4-year old boys, as
14 measured by the WPPSI-III test (Green 2019, eTable 2). These effect sizes are generally consistent with
15 each other.
16

17 52. The consistency of results in both population cohorts adds further confidence that the
18 association is real, particularly when viewed in the context of other studies that have reported inverse
19 associations between fluoride and IQ in many different locations in other countries, as well as general
20 knowledge about the vulnerability of the developing brain.

21 **E. Infant Fluoride/IQ Study (Till 2020)**

22 53. We recently completed and published a study that examined whether fluoride exposures
23 during infancy have an influence on IQ at 3-4 years (Till 2020).
24

25 54. Concerns have been raised about the use of fluoridated water in baby formula due to the
26 high intake of water by bodyweight during infancy. These high intakes have been associated with
27

1 significant increases in dental fluorosis, including in the permanent teeth.

2 55. In our study, we obtained information about fluoride intake of infants through
3 questionnaires that the mothers completed when the children were 30 to 48 months of age.⁸ The
4 questionnaire included the question, “How old was your baby when you ceased breastfeeding
5 exclusively?” Women who breastfed exclusively for six months or longer were included in the
6 breastfeeding (BF) group; those who reported introducing formula within the first six months (never
7 breastfed or partial breastfeeding) were included in the formula-feeding (FF) group.

8 56. As a separate measure of infant fluoride exposure, we estimated fluoride intake by
9 obtaining the measured water fluoride levels within the water treatment plant boundary during infancy.
10 We took the average of these levels, multiplied by the amount of time that that the infant was not
11 exclusively breast-fed during the first year,⁹ and divided it by the estimated average water intake among
12 Canadian formula-fed infants (0.8 L). We excluded any mother-offspring pair if the mother reported not
13 drinking tap water.
14

15 **1. Methodological Strengths**

16 57. Our study of infants shares many of the same methodological strengths as our prenatal
17 study, including: (i) prospective cohort design; (2) extensive control for potential confounders (discussed
18 below); (3) blinded assessment; (4) relatively large cohort (398 mother-offspring pairs) from both
19 fluoridated and non-fluoridated areas; (5) the same validated and standardized IQ test that we used for the
20 prenatal study (i.e., Wechsler Primary and Preschool Scale of Intelligence-III); and (6) rigorous statistical
21
22

23 ⁸ The answers to these questions correlated well with the contemporaneous infant feeding practices
24 that were reported among 11% of the cohort. Among women with breastfeeding questionnaire data and
25 infant feeding observation data, the median difference for when breast-feeding ceased was 0 months, with
26 two-thirds being within 1.5 months of each other.

27 ⁹ The mean duration of exclusive breastfeeding was 4.98 months; 13.6% of women reported never
28 breastfeeding, 8% reported discontinuing breastfeeding after the first three months, and 50.2% reported
continuing to breastfeed at six months or longer. Average water fluoride concentration did not
significantly differ between the BF (mean=0.32 mg/L) and FF groups (mean=0.29 mg/L; p=.18).

1 analyses that tested for sex-specific effects and scrutinized the impact of outliers and influential points.

2 58. We adjusted for potential confounding by selecting covariates *a priori* that have been
3 associated with fluoride, breastfeeding, and children's intellectual abilities. Final covariates¹⁰ included
4 child's sex and age at testing, maternal education, maternal race, second-hand smoke in the home, and
5 quality of the child's home environment (measured at time of testing using the Home Observation for
6 Measurement of the Environment (HOME)). We also controlled for fetal fluoride exposure, using the
7 previously measured maternal urinary fluoride concentrations averaged across each trimester of
8 pregnancy.
9

10 **2. Fluoride Exposure During Infancy Is Associated with Significant** 11 **Reductions in Non-Verbal IQ in the MIREC Cohort**

12 59. We found that fluoride exposure during infancy is associated with significant reductions in
13 non-verbal IQ in the MIREC cohort.

14 60. For each 0.5 mg/L increase in water fluoride concentration, we found a decrease of 4.4
15 Full-Scale IQ (FSIQ) points among preschool children who were formula-fed in the first six months of
16 life; 0.5 mg/L is the approximate difference in mean water fluoride level between fluoridated (0.59 mg/L)
17 and non-fluoridated (0.13 mg/L) regions. In contrast, we did not find a significant association between
18 water fluoride concentration and FSIQ among children who were exclusively breastfed in the first 6
19 months.
20

21 61. The association between water fluoride concentration and FSIQ must be interpreted with
22 caution, however, because the association became nonsignificant when two outliers were removed.

23 62. We observed an even stronger association between water fluoride and PIQ (non-verbal
24 intelligence). A 0.5 mg/L increase in water fluoride level predicted a decrement in non-verbal IQ in both
25

26 ¹⁰ For each analysis, a covariate was retained in the final model if its p-value was <0.20 or its inclusion
27 changed the regression coefficient of water fluoride concentration or fluoride intake from formula by more
28 than 10%.

1 the formula-fed (**9.3-points**) and the breastfed groups (**6.2-points**). Adjusting for fetal exposure or
2 removing two extreme scores did not appreciably alter these results.

3 63. We observed converging results using fluoride intake from formula feeding, which is a
4 continuous, time-weighted exposure estimate. For each 0.5 mg/day of fluoride intake, we found an **8.8-**
5 **point** decrement in non-verbal IQ; adjusting for fetal exposure attenuated the association only slightly
6 (**7.6-point** decrement).

7 64. The time-weighted fluoride intake estimate may reflect a more refined measure of exposure
8 in infancy because it captures differences in both water fluoride level and the proportion of time each child
9 was given formula over the first year of life. Yet, our binary classification of whether a child was
10 exclusively breastfed for the first 6 months may distinguish infants who are exposed to higher amounts of
11 fluoride during the early infancy period when the brain undergoes significant development because breast
12 milk contains minutes amounts of fluoride.

13 65. Taken together, these findings suggest that using “optimally” fluoridated water (0.7 mg/L)
14 to reconstitute infant formula may diminish the development of intellectual abilities in young children,
15 particularly non-verbal abilities. The findings also suggest that both prenatal and early childhood fluoride
16 exposure affect the development of non-verbal intelligence to a greater extent than verbal intelligence.
17 Prior studies examining prenatal exposure to fluoride and IQ showed a similar pattern.
18

19
20 **F. The Limitations of Our Studies Do Not Provide a Likely Explanation for the**
21 **Results**

22 66. As with all epidemiological studies, our fluoride studies have limitations. These
23 limitations, however, are unlikely to explain the large and significant associations that we have found
24 between early-life exposures and IQ.

25 67. Most of the limitations in our studies involve fluoride measurement. These limitations
26
27

1 include: (1) use of spot urine samples instead of 24-hour samples;¹¹ (2) lack of water fluoride
2 measurements from the participant's home; (3) reliance on questionnaire data as to water consumption
3 and breast-feeding; (4) lack of information on the fluoride content of the infant formula concentrate and
4 other sources of fluoride exposure; and (5) use of non-validated methods¹² for estimating total beverage-
5 based intake of fluoride by mothers and water fluoride intake by infants.

6 68. The limitations in our exposure estimates are non-differential, meaning they apply equally
7 to study participants with low fluoride exposure and high fluoride exposure. Non-differential errors in
8 exposure measurement will generally bias the results towards the null (i.e., attenuate, rather than inflate,
9 an association between exposure and outcome). Because of this, the limitations in our exposure estimates
10 do not provide a likely explanation for the significant IQ decrements we observed with fluoride exposures.
11 If anything, these limitations likely attenuated the relationship.

12 69. Another limitation of our studies is that the MIREC cohort tends to be more affluent, more
13 educated, and less ethnically diverse than the general population. Our results may thus not be
14 representative of how fluoride may affect IQ in more disadvantaged populations. On the other hand,
15 affluent populations tend to have less confounders (e.g., less exposure to other stressors and toxicants that
16 can negatively affect neurodevelopment) (Lanphear 2015). We thus worry less about the role of
17 confounders in the MIREC cohort than we would in other cohorts.

18 70. Finally, despite our comprehensive array of covariates included, our studies could not
19 address the possibility of unmeasured residual confounding. This is a limitation in all observational
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23 ¹¹ A 24-hour sample of urine is considered the optimal dosimeter for measuring chronic fluoride
24 exposure (WHO 2014). While we did not have 24-hour samples available to test, we partially controlled
25 for this by adjusting samples by creatinine. Creatine-adjusted urine fluoride measurements have been
26 found to have a strong correlation with 24-hour samples (Villa 2010; Zohouri 2006).

27 ¹² These methods were not validated in the sense that they have not yet been replicated by other
28 authors in other studies. Our method for assessing fluoride intake from beverages did show internal
validity, however, by predicting maternal urinary fluoride levels. This can be seen in the highly significant
correlations that we found ($p < 0.0001$) between maternal urinary fluoride and number of glasses of water
consumed per day and black tea consumption (see Till 2018).

1 studies, and thus inherent to the field. One of the potential confounders for which we lacked data was
2 maternal IQ. We did, however, control for maternal education which is highly correlated with maternal
3 IQ. Moreover, a greater proportion of women living in fluoridated communities (76%) had a university-
4 level degree compared with women living in nonfluoridated communities (66%), and thus it seems
5 unlikely that controlling for maternal IQ would affect our results, particularly since there is no reason to
6 believe that maternal IQ would be correlated with maternal urinary fluoride.

7
8 71. I understand that the EPA has suggested that the location of our study in Canada somehow
9 reduces the relevance of our findings to populations in the US. I disagree. From a biologic standpoint,
10 there is no credible basis to believe that people in the U.S. will respond differently to fluoride than people
11 in Canada. Nor am I aware of any credible reason to conclude, let alone suspect, that people in water-
12 fluoridated areas of the U.S. are exposed to materially less fluoride than people in water-fluoridated cities
13 of Canada.

14 **IV. CONCLUSION**

15
16 72. The collective evidence from prospective cohort studies supports the conclusion that
17 fluoride exposure during early brain development diminishes the intellectual abilities in young children,
18 including at the purportedly “optimal” levels of exposure for caries prevention.

19
20 I declare under penalty of perjury, under the laws of the United States, that the foregoing is true
21 and correct to the best of my knowledge and belief.

22 Executed on May 20, 2020, in Vancouver, British Columbia, Canada.

23
24 
25 BRUCE LANPHEAR, MD, MPH

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**CURRICULUM VITAE OF
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Employment

1984-1986 Paramedic, Jackson County Jail, Kansas City, Missouri
1988-1989 Physician, International Travel Clinic, University of Cincinnati, Cincinnati, Ohio
1988-1989 Staff Physician, Sexually Transmitted Disease Clinic, Cincinnati Public Health Department, Cincinnati, Ohio
1989-1992 Assistant Professor of Environmental Health, Associate Director, Medical Center Health Services, University of Cincinnati
1992-1997 Senior Instructor, Departments of Pediatrics and of Community & Preventive Medicine, University of Rochester School of Medicine.
1992-1994 National Research Scholar Award in General Pediatric Research, University of Rochester School of Medicine and Dentistry.
1992-1997 Assistant Professor, Department of Pediatrics and of Community & Preventive Medicine, University of Rochester School of Medicine.
1997-2002 Associate Professor, Department of Pediatrics, Children's Hospital Medical Center and the University of Cincinnati, Cincinnati, Ohio.
1997-2008 Director, General Pediatric Research Fellowship Training Program, Children's Hospital Medical Center and the University of Cincinnati.
1997-2008 Director, Children's Environmental Health Center, Children's Hospital Medical Center and the University of Cincinnati.
1997-2006 Associate Professor (Adjunct), Departments of Pediatrics and of Environmental Medicine, University of Rochester School of Medicine & Dentistry, Rochester, NY.
1998-2003 Associate Director for Research, Division of General & Community Pediatrics, Children's Hospital Medical Center.
2001-2002 Associate Professor (tenured), Department of Pediatrics, University of Cincinnati, Cincinnati, Ohio.
2001-2004 Associate Professor (Adjunct), Department of Environmental Health Sciences, University of Michigan School of Public Health, Ann Arbor, Michigan.
2002-2008 Sloan Professor of Children's Environmental Health, Departments of Pediatrics and Environmental Health, University of Cincinnati, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio.

- 2008-2012 Adjunct Professor of Pediatrics, Department of Pediatrics, Cincinnati Children's Hospital Medical Center and the University of Cincinnati.
- 2008- Professor of Children's Environmental Health, Faculty of Health Sciences, Simon Fraser University
- 2008- Clinician Scientist, Child & Family Research Institute, BC Children's Hospital, University of British Columbia

Education

- 1980-1985 Bachelor of Arts in Biology
- 1980-1986 University of Missouri at Kansas City, Medical Degree (1986)
- 1986-1987 Internship, University of Arkansas for Medical Sciences, Little Rock, Arkansas
- 1987-1988 Tulane School of Public Health & Tropical Medicine
Masters in Public Health & Tropical Medicine
- 1987-1989 General Preventive Medicine and Public Health Residency
Tulane School of Public Health & Tropical Medicine
- 1992-1995 Postdoctoral Fellowship in General Academic Pediatric Research
University of Rochester School of Medicine, Rochester, NY

Awards and Honors

- 2011 Sterling Prize in Controversy, Simon Fraser University
- 2012 Research Integrity Award, International Society for Environmental Epidemiology
- 2013 Public Policy and Advocacy Award, Academic Pediatric Association
- 2015 Research Award, Academic Pediatric Association
- 2015 Confederation of Union Faculty Associations of British Columbia (CUFA-BC) Academic of the Year Award
- 2018 Lumina Award from the Women for Healthy Environmental Health, Pittsburgh, PA

Teaching Experience

- 1992-1997 Course Instructor, "Public Health & the Environment", Department of Community & Preventive Medicine, The University of Rochester School of Medicine and Dentistry. A required course for MPH students taught annually.
- 1997-2008 Founding Director, NIH-funded, General Academic and Community Pediatric Research Fellowship Training Program, Cincinnati Children's Hospital Medical Center. This interdisciplinary, research training program, which included pediatricians, psychologists and epidemiologists, was the first training program in Children's Environmental Health.
- 1998-2008 Course Co-Instructor, "Children's Health & the Environment", Department of Environmental Health, The University of Cincinnati School of Medicine. A course taught every other year to MPH, PhD and postdoctoral trainees in medical subspecialties.
- 2008- Course Instructor, "Children's Health and the Environment". A 2-week intensive course taught annually to 4th year undergraduate students at Simon Fraser University.
- 2011- Course Instructor, "Plagues, Pollutants and Poverty: The Origins and Evolution of Public Health". An undergraduate course at Simon Fraser University.

Committee and Community Involvement

- 1993-1997 Lead Poisoning Prevention Task Force, Monroe County Health Department.
- 1994-1997 Investigational Review Board, Rochester General Hospital
- 1995- Scientific Consultant, National Center for Healthy Housing, Columbia, Maryland.
- 1996-1997 Member, New York State Task Force on Environmental Neurotoxins, University of Rochester School of Medicine
- 1996-2001 Member, National Institute for Environmental Health Sciences Grant Review Committee for Community-Based Interventions (FG)
- 1996-1998 Chairman, U.S. Department of Housing and Urban Development Committee on Lead-Contaminated House Dust
- 1998 Member, Review Group for National Research Service Awards, Health Resources and Services Administration
- 1998-2000 Member, Cincinnati Board of Health, Cincinnati, Ohio.
- 1998-2001 Member, Science and Research Work Group, Office of Children's Health Protection Advisory Committee, U.S. EPA
- 1998-2000 Member, Cincinnati Lead Poisoning Prevention Advisory Task Force, Cincinnati, Ohio.
- 1999 Member, K23 Grant Review Committee, National Institute for Environmental Health Sciences, August 1999
- 1999 Member, Expert Panel on Soil Pica Behavior, Agency for Toxic Substance Disease Registry, June 7th-8th, Atlanta, Georgia
- 2000 Member, Panel on Health Disparities: Linking Biological and Behavioral Mechanisms with Social and Physical Environments, National Institute for Environmental Health Sciences, July 14-15th
- 2000-2002 Member, Workshop on Assessing Environmental Exposures to Children, U.S. Environmental Protection Agency, July 26-27th
- 2000-2004 Member, Children's Environmental Health Project, AAP's Child Health Research Center, Rochester, NY.
- 2001 Senate Testimony, "Ensuring that Children with Dangerous Levels of Lead in their Blood Receive Care as Early as Possible". Subcommittee on Housing and Transportation of the Committee on Banking, Housing and Urban Affairs, 107th U.S. Congress, November 13th, 2001.
- 2001 Reviewer, National Research Council, National Academy of Science Update of the 1999 Arsenic in Drinking Water Report
- 2001-2003 Member, Expert Panel on Children's Health and the Environment, North American Commission for Environmental Cooperation
- 2002- Member, Scientific Advisory Board, Scientist Communication Network.
- 2003 Member, "Herculaneum Health Study Workshop" Agency for Toxic Substance Diseases Registry, May 22nd to 23rd, 2003
- 2003-2004 Panel Member, "Lead Poisoning in Pregnant Women", Mt. Sinai for Children's Health and the Environment, New York, NY
- 2003 Member, "Invitational Workshop on a proposed American Family Study" National Human Genome Research Institute, December 1st to 3rd, 2003.

2004-2006 Member, Committee on “Ethical Consideration for Research on Housing-Related Health-Hazards involving Children”, National Research Council and the Institute of Medicine, The National Academies

2004 Congressional Testimony, “Tapped Out? Lead in the District of Columbia and the Providing of Safe Drinking Water”, Subcommittee on Environment and Hazardous Materials of the Committee on Energy and Commerce, U.S. House of Representatives, 108th Congress, July 22nd, 2004

2005 Reviewer, “Superfund and Mining Megasites – Lessons from the Couer d’ Alene River Basin”, National Research Council, The National Academies.

2005 Ad Hoc Member, NIEHS Board of Scientific Counselors Review of the Epidemiology Branch, April 3rd to April 5th, 2005

2005 Senate Briefing, “The Connection of Environmental Chemicals and Learning Disabilities”, U.S. Senate, May 10th, 2005

2006 Invited Participant, NIEHS Strategic Planning Forum, National Institute for Environmental Health Sciences, Chapel Hill, North Carolina, October 17-18th, 2006.

2006-2008 Member, U.S. EPA's Clean Air Scientific Advisory Committee Lead Review Panel.

2006-2008 Member, National Children’s Study Steering Committee, NICHD

2006 Invited Participant, “How Does Housing Affect Health Outcomes of Children?”, MacArthur Foundation, Chicago, Illinois, June 21st-22nd, 2006.

2006- 2010 Member, External Scientific Advisory Committee, Richmond Center for Excellence in Tobacco Research, American Academy of Pediatrics.

2007 Testimony, Vermont State Legislature, “The Lingering Legacy of Lead Toxicity”, Montpelier, Vermont, February 1st, 2007

2007 Testimony, Connecticut State Legislature, “The Legacy of Lead Toxicity”, Hartford, Connecticut, March 14th, 2007. (PG)

2007 Invited Testimony, United States Senate Hearing, “Lead and Children’s Health”. Committee on Environmental and Public Works, October 18th, 2007

2007-2008 Member, Committee on “Committee on Contaminated Drinking Water at Camp Lejeune”, National Research Council, The National Academies.

2008 Member, Expert Panel on Health and the Environment, Statistics Canada, Ottawa,

2008- Member, Alliance for the Global Elimination of Lead Paint, Intergovernmental Forum on Chemical Safety (IFCS), World Health Organization

2008-2009 Reviewer, Toxicological Review and Recommended Toxicological Reference Values for Environmental Lead Exposure in Canada, Health Canada

2009-2013 Scientific Advisor, Canada Lead Study funded by Health Canada (Patrick Levallois, Principal Investigator).

2009-2014 Board Member, Barro Sin Plomo

2009-2010 Member, Health and Environment Experts Advisory Group of the Canadian Longitudinal Study on Aging, Canadian Institutes of Health Research

2010-2012 Member, US Environmental Protection Agency Science Advisory Board for Evaluating Dust Lead Standards

2010-2013 Advisor, Canada Environmental Health Law and Canadian Partnership for Children’s Health and Environment Retrofit Project

2010-2012 Member, Physicians Advisory Panel, Canada Health Measures Survey

2010 Invited Testimony, United States Senate Hearing, “Research on Environmental Health Factors with Autism and Neurodevelopmental Disorders”, August 3rd, 2010

2010 Member, Joint FAO/WHO Expert Panel for Toxicological and Health Review of Bisphenol A

2010-2015 Board Member, Global Community Monitoring, Oakland, California

2010- Chairman, Scientific Advisory Committee for Dartmouth University’s Program in Children’s Health and the Environment

2011-2016	Member, American Academy of Pediatrics Executive Council on Environmental Health
2011-2012	Member, US Environmental Protection Agency Science Advisory Board for Evaluating Hazards of Partial Water Line Replacement
2011	Invited Testimony, Special Committee on Cosmetic Pesticides, Legislative Assembly, Province of British Columbia, October 7 th , 2011
2011-2012	Member, Panel on Health Effects of Low-level Lead, Office of Health Effects, National Toxicology Program of the National Institutes of Environmental Health Sciences,
2012-	Member, Expert Advisory Committee, Canada Health Measures Survey
2012-	Member, Environmental Defence Fund Science Advisory Committee on Toxics
2015	Reviewer, Review of Clinical Guidance for the Care of Health Conditions Identified by the Camp Lejeune Legislation, Institute of Medicine, The National Academies
2016-	Member, The Lancet Commission on Pollution, Health & Development
2016-	Member, Targeting Environmental Neuro-Developmental Risks (TENDR)
2016	Member, Steering Committee, The National Lead Summit, United States
2017	Rockefeller Foundation Academic Writing Retreat, Bellagio, Italy
2017-	Member, Advisory Committee for the Flint (MI) Cohort Study
2017-	Pure Earth Leadership Council
2018-	Member Project TENDR Advisory Board
2018-	Member, Mercury Disability Board Committee, Health Canada

Editorial Boards

2000-2015	Assistant Editor, <i>Environmental Research</i>
2000-2008	Deputy Editor, <i>Public Health Reports</i>
2004	Associate Editor, <i>Pediatrics</i> supplement on Children's Environmental Health
2004-2017	Editorial Board Member, <i>PLoS Medicine</i>
2005-2014	Editorial Board Member, <i>Breastfeeding Medicine</i>
2007-	Editorial Board Member, <i>Environmental Health</i>
2008-2012	Editorial Review Board Member, <i>Environmental Health Perspectives</i>
2012-2015	Associate Editor, <i>Environmental Health Perspectives</i>
2016-	Advisor, <i>Environmental Health Perspectives</i> News Section

Societies and Organizations

1989-2008	American Public Health Association
1996-2015	Academic Pediatric Association
1997-2012	American Association for the Advancement of Science
2000-2008	Society for Pediatric Research
2001-2008	American Pediatric Society
2001-2016	Specialty Fellow, American Academy of Pediatrics
2006-	Fellow, Collegium Ramazzini
2006-	Member, International Society for Environmental Epidemiology
2008-	Founding Member, International Society for Children's Health & the Environment
2011-2017	Secretary and Treasurer, International Society for Children's Health & the Environment
2012-	Member, International Society for Exposure Science
2017-2018	Vice-President, International Society for Children's Health & the Environment
2019-2020	President, International Society for Children's Health & the Environment

Video and Website Production – www.littlethingsmatter.ca

1. Canadian Environmental Health Atlas: A Portal to Discover the Promise of Environmental Health.
2. Shifting the Curve: The Impact of Toxins on ADHD in U.S. Children (video)
3. Little Things Matter: The Impact of Toxins on the Developing Brain (video)
4. Little Things Matter: The Impact of Toxins on Preterm Birth (video)
5. Prevention Paradox: Why We are Failing to Prevent Disease (video)
6. Little Things Matter: The Deadly Impact of Airborne Particles (video)
7. Cause or Cure: A Plea for Prevention (video)
8. Crime of the Century: The Failure to Prevent the Lead Pandemic (video)

Original Research

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10. Braun J, Kahn RS, Froehlich T, Auinger P, Lanphear BP. Comments on "Exposures to environmental toxicants and attention deficit hyperactivity disorder in U.S. children." *Environ Health Perspect.* 2007;115:A399.
11. Geraghty SR, Morrow AL, Lanphear B. The heart of the matter on breastmilk and environmental chemicals: essential points for healthcare providers and new parents. *Breastfeed Med.* 2009;4:125-126.
12. Joshi TK, Bailar JC 3rd, Craner J, Davis D, Ehrlich R, Franco G, Frank AL, Huff J, LaDou J, Lanphear B, London L, Melnick RL, O'Neill R, Osaro E, Rosenman KD, Sass J, Smith AH, Soskolne CL, Stephens C, Stuckey R, Takaro TK, Teiteibaum D, Watterson A, Yassi A. Physician expelled from Indian Association of Occupational Health after critique. *Int J Occup Environ Health.* 2009 Oct-Dec;15(4):419-420.
13. Calafat AM, Koch HM, Swan SH, Hauser R, Goldman LR, Lanphear BP, Longnecker MP, Rudel RA, Teitelbaum SL, Whyatt RM, Wolff MS. Misuse of blood serum to assess exposure to bisphenol A and phthalates. *Breast Cancer Res.* 2013;15:403.
14. Soskone CL, Al-Delaimy WK, Burns K, Finch MR, Gaudino JA, Jr, Lanphear B, Oremus M, Phillips L, Ruff K, Weiss SH, Wing S. Competing interests in epidemiology. *BMJ* 2015;350.PMID: 25569167.
15. Taylor MP, Forbes MK, Opeskin B, Parr N, Lanphear BP. Further analysis of the relationship between atmospheric lead emissions and aggressive crime: an ecological study. *Environ Health* 2018;17:doi: 10.1186/s12940-018-0354-5.
16. Lanphear BP, Hornung RW, Auinger P, Allen R. Environmental exposure to lead: old myths never die. *Lancet Public Health* 2018;e363 doi: 10.1016/S2468-2667(18)30128-2.

Presentations

1. "Biologic Hazards to Health Care Personnel in the Workplace". University of Cincinnati, Cincinnati, Ohio, September 26, 1990.
2. "Common Misconceptions about Tuberculosis". American Lung Association, St. Elizabeth's Hospital, Belleville, IL, March 19, 1991.
3. "Prevention and Control of Infectious Disease in Health Care Workers". Miami Valley Hospital, Dayton, OH, September 5, 1991.

4. "Transmission of Hepatitis B Virus Infection in Health Care Workers". Ohio University, Athens, Ohio, March 21, 1992.
5. "Universal Immunization Against Hepatitis B Virus". Grand Rounds, Dayton Children's Hospital, May 1992, Dayton, Ohio.
6. "Correlation of Blood Lead Levels and Dust Lead Levels Using Three Dust Collection Methods. Environmental Protection Agency, Research Triangle, N.C., January 20, 1994.
7. "Relation of Lead-Contaminated House Dust and Blood Lead Levels in Urban Children" Environmental Protection Agency, Washington, D.C., February, 1994.
8. "Lead-Contaminated House Dust and Blood Lead Concentrations in Children", Society for Pediatric Research, Seattle, Washington May 5, 1994.
9. "EPA Health-Based Standards for Soil and Dust". Alliance to End Childhood Lead Poisoning, Washington, D.C., May 17, 1994.
10. "Epidemiology of Tuberculosis in Health Care Settings". University of Cincinnati, Cincinnati, OH, August 19, 1994.
11. "A Side-by-Side Comparison of Sampling Methods for Lead-Contaminated House Dust". American Public Health Association, Washington, D.C., November 1, 1994.
12. "Trends in Childhood Exposure to Lead: Implications for Prevention". University of Rochester, Pediatric Grand Rounds, February 15, 1995.
13. "Childhood Exposure to Lead". Visiting Professor, Nazareth College, Rochester, New York, March 24, 1995.
14. "Transmission and Control of Infections in Health Care Workers". (Moderator & Speaker) American College of Occupational Environmental Medicine, Las Vegas, Nevada, May 4, 1995.
15. "Lead Exposure Prevention Research at the University of Rochester". New England Lead Conference, Kennebunkport, Maine, August 3, 1995.
16. "Prevention of Childhood Lead Exposure". 1st Annual Midwest Conference on Childhood Lead Poisoning Prevention, Kansas City, MO, September 10-11, 1995.
17. "Childhood Lead Exposure: Implications for Occupational Health". National Institute for Occupational Safety and Health, Cincinnati, OH, May 10, 1996.
18. "Community Characteristics and Children's Blood Lead Concentrations". American Public Health Association, New York City, NY, November 19, 1996.
19. "Evolution of a Disease: The Science of Childhood Lead Exposure Prevention." American Public Health Association, New York City, NY, November 18, 1996.
20. "Childhood Lead Exposure: A Local and National Perspective." Occupational Medicine Grand Rounds, University of Rochester, January 2, 1997.

21. "Prevention of Childhood Lead Exposure: The U.S. Experience". (Keynote) University of the West Indies and Pan American Health Organization, Kingston, Jamaica, January 23, 1997
22. "Lead-Contaminated House Dust and Children's Blood Lead Levels". (Keynote Presentation) Look Out for Lead Conference, Madison, WI, May 22, 1997.
23. "Primary Prevention of Childhood Lead Exposure: A Randomized Trial of Dust Control". American Public Health Association, Indianapolis, November 13, 1997.
24. "Evolution of a Disease: Prevention of Childhood Lead Exposure." Pediatric Grand Rounds, Medical University of South Carolina, Charleston, SC, March 20, 1998.
25. "The Science of Childhood Lead Exposure Prevention." Tulane/Xavier Center for Bioenvironmental Research, New Orleans, May 4-5th, 1998.
26. "Lead Hazard Control Research" Conference on Linking Health, Housing & Environment, Centers for Disease Control, Department of Housing and Urban Development, National Institutes of Health, Phoenix, Arizona, June 21-24, 1998.
27. "A Randomized Trial of Dust Control to Prevent Childhood Lead Exposure." Presenter and Co-chairman, Section on Heavy Metals, 1st International Conference on Children's Environmental Health, Amsterdam, The Netherlands, August 11-13th, 1998.
28. "Prevention of Childhood Lead Exposure: A Critique of the EPA's Proposed Residential Lead Standard". Office of Children's Health Protection, U.S. Environmental Protection Agency, Washington, D.C., November 5, 1998.
29. "Science and Policy of Lead Poisoning Prevention in the United States". Nicholas School of the Environment, Duke University, Durham, North Carolina, February 22, 1999.
30. "Behaviors in Early Childhood and Exposure to Environmental Toxins". (invited) Pediatric Environmental Health Conference, San Francisco, CA May 4, 1999.
31. "Patterns of Lead Exposure in Early Childhood". International Conference on Lead Exposure, Reproductive Toxicity and Carcinogenicity, Gargnano, Italy, May 7, 1999.
32. "Adverse Effects of Blood Lead Concentrations <10 µg/dL" (Invited), 17th International Conference Neurotoxicology Conference, Little Rock, Arkansas, October 17-20, 1999.
33. "Emerging Research and Implications for Prevention of Childhood Lead Exposure" (Invited), 2nd Annual Syracuse Lead Conference, Syracuse, New York October 27th, 1999.
34. "Prevention of Lead Poisoning in Children" Sierra Club, Omaha, NE, November 16th, 1999.
35. "Children's Environmental Health: A Focus on Residential Hazards" Department of Pediatrics, University of Nebraska Hospital, November 17th, 1999.
36. "Effectiveness of Lead Hazard Controls", New England Lead Conference, New Hampshire, Tufts University School of Medicine, April 25, 2000.

37. "Subclinical Lead Toxicity in U.S. Children and Adolescents", Pediatric Academic Societies, Boston, MA, May 15, 2000.
38. "Contribution of Residential Exposures to Asthma in U.S. Children and Adolescents", Pediatric Academic Societies, Boston, MA, May 16, 2000.
39. "The Effect of Soil Abatement on Blood Lead Concentration in Children living near a former Smelter and Milling Operation" (invited). Coeur d'Alene, Idaho, May 24, 2000.
40. "The Paradox of Lead Poisoning Prevention" (invited). National Institute of Justice, Washington, D.C., July 18th, 2000.
41. "Evolution of a Disease: Prevention of Childhood Lead Exposure." Pediatric Grand Rounds, Children's Hospital Medical Center, Cincinnati, Ohio, August 22, 2000.
42. "Children's Environmental Health: A Focus on Residential Hazards" Pediatric Grand Rounds, Department of Pediatrics, University of Rochester School of Medicine, Rochester, NY, September 20th, 2000.
43. "Prevention of Lead Poisoning in Childhood" 7th Annual Childhood New York State Lead Poisoning Prevention Conference, Purchase College, NY, September 29, 2000.
44. "Excavating the Enigmas of Childhood Lead Exposure". Department of Environmental and Occupational Medicine, Harvard University School of Public Health, Boston, MA, October 16th, 2000.
45. "Contribution of Residential Exposures to Asthma". Eliminating Childhood Lead Poisoning: Our Challenge for the Decade, Centers for Disease Control and the U.S. Department of Housing & Urban Development, December 11th, 2000.
46. "Setting Research Priorities for the Decade". (Moderator & Speaker) Eliminating Childhood Lead Poisoning: Our Challenge for the Decade, Centers for Disease Control and the U.S. Department of Housing & Urban Development, December 13th, 2000.
47. "Evolution of a Disease: Prevention of Childhood Lead Exposure." (Keynote Presentation) Look Out for Lead Conference, Madison, WI, April 12, 2001.
48. "Environmental Lead Exposure and Children's Intelligence at Blood Lead Concentrations below 10 µg/dl." APA Presidential Plenary Session, Pediatric Academic Society Meeting, Baltimore, MD, April 30, 2001.
49. "Elimination of Childhood Lead Exposure: Obstacles & Opportunities" (Plenary). National Housing Conference and Exposition, New Orleans, LA, May 16th, 2001.
50. "Prevention of Childhood Lead Exposure: A Public Health Perspective" (Keynote Presentation). Philadelphia Health Department, Philadelphia, PA, May 23rd, 2001.

51. "Evolution of a Disease: Prevention of Childhood Lead Exposure." (Keynote Presentation), Charles Drew University, Los Angeles, California, October 22nd, 2001.
52. "Primary Prevention of Childhood Lead Exposure" (Keynote Presentation), Midwest Regional Lead Conference, Pittsburgh PA, October 29th, 2001.
53. "Prevention of Childhood Lead Exposure: Shifting to Primary Prevention" (Keynote Presentation), Indiana Department of Health, Lead-Safe Conference, November 7th, 2001.
54. "A Strategy for Primary Prevention of Childhood Lead Exposure" A testimony to Housing and Transportation Subcommittee, U.S. Senate, Washington, D.C., November 13, 2001.
55. "Ethical issues of Environmental Research involving Children" (moderator and speaker). Panelists were Jeffrey Kahn, Ph.D., and Leonard Glantz, J.D., Raleigh-Durham, North Carolina, NIEHS Conference of Children's Environmental Health Centers, January 23, 2001.
56. "Evolution of a Disease: Science and Prevention of Childhood Lead Exposure." Grand Rounds, Omaha Children's Hospital, Omaha, Nebraska, March 1, 2002.
57. "Racial Disparities in Children due to Environmental Hazards" Ohio Commission on Minority Health, Columbus, Ohio March 27, 2002.
58. "Prevention of Childhood Lead Exposure in a Former Mining Community" Tar Creek, Oklahoma, April 4, 2002.
59. "Evolution of a Disease: Science and Prevention of Childhood Lead Exposure." Grand Rounds, Hasbro Children's Hospital, Brown University, Providence Rhode Island, May 17, 2002.
60. "Evolution of a Disease: Science and Prevention of Childhood Lead Exposure." Grand Rounds, Dayton Children's Hospital, Wright University, Dayton, Ohio May 22, 2002.
61. "Evolution of a Disease: Science and Prevention of Childhood Lead Exposure." International Lead Congress, Washington, DC, June 3rd, 2002.
62. "Residential Hazards: A Neglected Health Problem" Agency for Toxic Substances Disease Registry, Centers for Disease Control and Prevention, Atlanta, Georgia, August 19th, 2002.
63. "Control of Residential Exposures to Environmental Neurotoxins" National Center for Healthy Homes (Moderator and Speaker), Annapolis, VA, November 7th, 2003.
64. "The Promises and Potential Pitfalls of Primary Lead Poisoning Prevention" Purchase College, 9th Annual Childhood New York State Lead Poisoning Prevention Conference, Purchase College, New York,, October 4th, 2002.
65. "Evolution of a Disease: the Science and Prevention of Childhood Lead Exposure." Pediatric Grand Rounds, Syracuse, NY, October 9th, 2002.
66. "Evolution of a Disease: the Science and Prevention of Childhood Lead Exposure." University of Texas at El Paso, El Paso, Texas January 29th, 2003.

67. "Childhood Lead Poisoning" Introduction to Children's Environmental Health, Seattle, Washington, Pediatric Academic Society, May 3rd, 2003.
68. "The Legacy of Lead: Childhood Lead Poisoning in the 21st Century". Chicago Lead Summit, Chicago, Illinois, May 28th, 2003.
69. "The Legacy of Lead: Childhood Lead Poisoning in the 21st Century". Case Western Reserve University, Cleveland, Ohio, June 3rd, 2003.
70. "Housing and Children's Health", Sprawl: The impact on vulnerable populations, University of Cincinnati College of Medicine, Cincinnati, Ohio, July 8th, 2003.
71. "Trials and Tribulations of Protecting Children from Environmental Toxins". Duke University, Nicholas School of the Environment, Durham, NC, November 6th, 2003.
72. "Adverse Effects of Fetal and Childhood Exposures to Prevalent Toxins" Midwest Critical Regional Neonatology Conference, Covington, KY, November 14th, 2003.
73. "Control of Residential Hazards in Children" American Public Health Association, San Francisco, CA, November 18th, 2003.
74. "Low-Level Exposure to Environmental Lead Exposure and Children's Intellectual Function: An International Pooled Analysis". 21st International Neurotoxicology Conference, Honolulu, Hawaii, February 11th, 2004.
75. "Trials and Tribulations of Protecting Children from Environmental Hazards" Workshop on Ethical Issues on Children's Environmental Health, Children's Environmental Health Network, Washington, D.C. March 5, 2004.
76. "Low-Level Exposure to Environmental Lead Exposure and Children's Intellectual Function: An International Pooled Analysis", Pediatric Academic Societies Annual Meeting. Pediatric Research 2004;55:163A.
77. "The Impact of the Environment on Children's Health" Bob Smith Endowed Lecture, Department of Pediatrics, First Gulf Coast Children's Environmental Health Symposium, Baylor University, Houston, Texas.
78. "The Search for Environmental Causes of Learning Disabilities, Learning Disabilities Initiative, Baltimore, MD, May 18th, 2004.
79. "Residential Hazards in Children: A Neglected Public Health Problem", Pediatric Grand Rounds, Boston Medical Center, Department of Pediatrics, Boston University Medical Center, Boston, MA, May 20th, 2004.
80. "Residential Hazards in Children" "Healthier Homes, Stronger Families: Public Policy Approaches to Healthy Housing", National Center for Healthy Housing, Washington, D.C., June 2nd, 2004.

81. "Fetal and Early Childhood Exposures to Prevalent Toxins" Pediatric Grand Rounds, Ste. Justine Children's Hospital, University of Montréal, Montreal, Canada, June 16th, 2004.
82. "Childhood Exposure to Lead-Contaminated Soil: A Problem of the Past or a Problem from the Past?" National Academy of Science Committee on Superfund Site Assessment and Remediation in Coeur d'Alene River Basin", June 17th, 2004, Coeur d'Alene, Idaho.
83. "The Legacy of Lead" (Keynote Speaker). Chicago Lead Summit, Region V EPA Headquarters, September 15th, 2004.
84. "A Tale of Two Toxins: Children's Exposure to Tobacco and Lead" (with Michael Weitzman), The American Academy of Pediatrics, San Francisco, CA, October 10th, 2004.
85. "A Legacy of Childhood Lead Poisoning" University of Washington, Seattle, Washington, October 30, 2004.
86. "Protecting Children from Environmental Toxins", Pediatric Grand Rounds, Seattle Children's Hospital, Seattle Washington, March 10th, 2005.
87. "The Science and Politics of Childhood Lead Poisoning", Northwest Pediatric Environmental Health Conference, University of Washington, Seattle, Washington, March 11th, 2005.
88. "The Effects of Low-level Exposure to Environmental Toxins during Fetal Development and Early Childhood", Children's' Hospital of Fudan University, Shanghai International Pediatric Forum, Shanghai, China, June 16th to 18th, 2005.
89. "The Role of Biomarkers in Revealing Genetic and Environmental Influences of Disease and Disability" Psychiatry Grand Rounds, University of Cincinnati, February 8th, 2006.
90. "Trials and Tribulations of Protecting Children from Environmental Hazards: Ethical Issues", Johns Hopkins University of Medicine, March 17th, 2006.
91. "Key Elements of a Primary Prevention Strategy for Lead Poisoning", Albany Law School, Union University, Albany, New York, March 16th, 2006.
92. "Low-Level Lead Toxicity: The Ongoing Search for a Threshold", Case Western Reserve University, City Club of Cleveland, Cleveland, OH March 4th, 2006.
93. "Integrating Genetic and Environmental Influences in Pediatric Research" (Moderator and Speaker), Pediatric Academic Societies, San Francisco, CA, April 30th 2006.

94. "Ethical Issues in Housing Health Hazard Research Involving Children" (Topic Symposia) Pediatric Academic Societies, San Francisco, CA, May 2nd 2006.
95. "Low-Level Lead Toxicity: The Ongoing Search for a Threshold", International Workshop on Neurotoxic metals: from Research to Prevention, University of Brescia, Italy, June 17th, 2006.
96. "Efficacy of HEPA-CPZ Air Cleaners on Unscheduled Asthma Visits and Asthma Symptoms", International Society for Environmental Epidemiology, Paris France, September 6th, 2006.
97. "Protecting Children from Environmental Toxins", Region VIII Children's Environmental Health Summit, Vail, Colorado September 20th, 2006.
98. "Integrating Genetic and Environmental Biomarkers in Pediatric Epidemiology", Visiting Professor, Simon Fraser University and University of British Columbia, Vancouver, British Columbia, October 19th-20th, 2006.
99. "The Legacy of Lead", Indiana Lead Conference, Indianapolis, Indiana, October 24, 2006.
100. "Ethical dilemmas in Children's Environmental Health", Seminar Series in Ethics of Toxicology, University of Champagne-Urbana, Champagne, Illinois, November 19th, 2006.
101. "Low-Level Lead Toxicity: Implications for Prevention", WHO Informal Workshop on Lead, University of Munich, Germany, November 30th, 2006.
102. "Low-Level Lead Toxicity: The Ongoing Search for a Threshold", National Environmental Public Health Conference, National Centers for Disease Control, Atlanta, Georgia, December 4th, 2006.
103. "The Epidemiologic Conquest of Childhood Lead Toxicity: A Pyrrhic Victory". NIEHS Workshop on Children's Environmental Health Research: Past, Present and Future. January 22nd, 2007.
104. "Linking Low-level Exposures to Environmental Toxicants with ADHD". Duke Integrated Toxicology and Environmental Health Program Symposium on Developmental Neurobehavioral Disabilities and Toxic Exposures, March 23, 2007, Durham, North Carolina.
105. "Using Biomarkers to Link Environmental Influences with Disease and Disability", The Channing Laboratory, Harvard University, Boston, Massachusetts, April 4th, 2007.
106. "The Lingering Legacy of Lead Toxicity". Grand Rounds, Department of Pediatrics, St. Louis Children's Hospital, St. Louis University, St. Louis, Missouri, April 11th, 2007.
107. "Protecting Children from Environmental Toxicants", United States Council of Catholic Bishops, Washington, D.C., April 30th, 2007.
108. "Efficacy of HEPA-CPZ Air Cleaners on Unscheduled Asthma Visits and Asthma Symptoms", Pediatric Academic Societies, APA Presidential Platform Plenary Session, Toronto, Canada, May 7th, 2007.

109. "The Lingering Legacy of Lead Toxicity" Grand Rounds, Department of Pediatrics, Omaha Children's Hospital, University of Nebraska, Omaha, Nebraska, April 11th, 2007.
110. "Linking Low-level Neurotoxicant Exposures of the Developing Brain to Learning and Behavioral Problems." International Conference on Developmental Programming and Effects of Environmental Toxicants in Human Health and Disease, Faroe Islands, May 20th, 2007.
111. "Protecting Children from Environmental Toxicants: The Neglected Legacy of Rachel Carson", National Policy Consultation Series on Children's Health and Environment, Moncton, New Brunswick, Canada, May 31, 2007.
112. "Low-Level Toxicity of Environmental Toxicants: Much Ado about Nothing?" Occupational and Environmental Health Seminar Series, Health Canada, Ottawa, Canada, June 6th, 2007.
113. "Linking Low-Level Lead Exposure with Child and Adolescent Psychopathology", 13th Annual International Society for Research in Child and Adolescent Psychopathology, London, England, June 19th, 2007.
114. "The Legacy of Lead Toxicity". Pediatric Grand Rounds, New York Presbyterian Hospital-Weill Cornell Medical Center, September 18th, 2007.
115. "Protecting Children from Environmental Toxicants: The Neglected Legacy of Rachel Carson". Pediatric Grand Rounds, Children's Hospital at Dartmouth, Dartmouth Medical School, September 19th, 2007.
116. "The Legacy of Lead Toxicity: Effects of Childhood Lead Exposure in Children, Adolescents and Adults". Mid-America Conference, Philadelphia, Pennsylvania, October 4th, 2007.
117. "Low-Level Toxicity of Environmental Toxicants: Much Ado about Nothing?" International Society for Exposure Analysis (invited plenary session), Raleigh-Durham, North Carolina, October 17th, 2007.
118. "The Global Elimination of Lead Toxicity: A Focus on Housing." National Institute of Public Health, Rennes, France, October 22nd, 2007.
119. "Linkage of Environmental Lead Exposure with Psychopathology in Children and Adolescents" Ramazzini Collegium, Carpi, Italy, October 25th, 2007.
120. "Linking Exposures to Environmental Toxicants with Child and Adolescent Psychopathology", Symposium on Environmental Toxicity and the Brain, University of Toronto, Toronto, Canada, December 7th, 2007.
121. "Linking Exposures to Environmental Toxicants with Child and Adolescent Psychopathology." Pediatric Grand Rounds, Rochester General Hospital and Strong Memorial Hospital, Rochester, New York, April 1&2, 2008.

122. "Rochester's Role in the Ongoing Elimination of Childhood Lead Toxicity." Beaven Lecture, Rochester Academy of Medicine, Rochester, New York, April 1, 2008.
123. "The Lingering Legacy of Lead Toxicity: Lansing Legacy." Michigan's Conference for Lead Safe & Healthy Homes, East Lansing, MI, April 22, 2008.
124. First Annual Controversies in Pediatric Environmental Health, "Should the Centers for Disease Control Lower the Blood Lead Level of Concern". A debate by Bruce Lanphear and George G. Rhoads (James Sargent, Moderator). Pediatric Academic Societies Meeting, Honolulu, Hawaii, May 2nd, 2008.
125. "Linking Exposure to Environmental Toxicants with Psychopathology in Children and Youth". Visiting Professor, Alberta Child and Youth Network, Calgary Children's Hospital, Calgary, Alberta. May 13th-15th, 2008.
126. "Lead Toxicity and the Teenage Brain", Youth Exploring Science Program, St. Louis Science Center, St. Louis, Missouri, June 30th, 2008.
127. "The Legacy of Childhood Lead Toxicity". Health Canada, Ottawa, Canada, October 6th, 2008.
128. "Protecting Children from Environmental Toxicants: The Neglected Legacy of Rachel Carson". The 2008 Rachel Carson Legacy Conference: Green Chemistry – Solutions for a Healthy Economy, Duquesne University, Pittsburgh, Pennsylvania, September 20th, 2008.
129. "Trials and Tribulations of Protecting Children from Environmental Hazards", Ethics in Toxicology Seminar Series, University of Champagne-Urbana, Champagne, Illinois, September 22nd, 2008.
130. "Industry's Influence on the Prevention of Childhood Lead Poisoning." In: Symposia on Insulating Environmental Health Research from Conflicting Interests. International Society for Environmental Epidemiology Annual Meeting, Pasadena, California, October 14th, 2008.
131. "The Lingering Legacy of Lead Toxicity: Implications for Research and Policy on Other Environmental Toxicants". (Keynote Presentation) BC Environmental and Occupational Health Research Network, Vancouver, BC, November 7th, 2008.
132. "Effects of Environmental Toxicants on Children's Development". DB-PREP Course, American Academy of Pediatrics, Atlanta, Georgia, December 5th, 2008.
133. "Linking Low-level Environmental Toxicants with New Morbidities of Childhood". BC Children's Grand Rounds, British Columbia, Vancouver, February 6th, 2009.
134. "Using Biomarkers to Link Exposures with Disease and Disability in Children". Workshop on Physical and Chemical Exposures in Canadian Cohort Studies, Canadian Institute of Health Research and Health Canada, February 8th-9th, 2009.

135. "How Dangerous Is Lead In Drinking Water?" An interview on "Around The Water Cooler" with Werner Troesken and Bruce Lanphear. February 18th, 2009.
136. "Linking Environmental Toxicants with ADHD in Children" (invited), Learning Disabilities Association Annual Meeting, February 25th, Salt Lake City, Utah.
137. "The Lingering Legacy of Lead Toxicity", Norfolk Children's Hospital, April 30th, 2009, Norfolk Virginia.
138. Second Annual Controversies in Pediatric Environmental Health Debate, "Should Pediatricians Advise Parents to Feed their Children Organic Foods?" A debate by Joel Forman and Janet Silverstein (Bruce Lanphear, Moderator and Organizer). Pediatric Academic Societies Meeting, Baltimore, MD, May 4th, 2009.
139. "A Pattern of Pathology: The Population Impact of Environmental Toxicants on Health". Workshop on Endocrine Disruptors, Endocrine Society, Washington, DC, June 9th, 2009.
140. "The Quandary of Environmental Contaminants in Human Milk", 25th Anniversary of US Surgeon General's Report on Breastfeeding, Washington, DC, June 13th, 2009.
141. "Linking Exposures to Environmental Toxicants with Learning Problems and Psychopathology in Children." Northwest Conference on Children's Health and Environment, Tukwila, Washington, October 1st, 2009.
142. "The Second Coming of the Sanitarians", Pediatric Grand Rounds, University of California at Davis Children's Hospital, Sacramento, California, October 9th, 2009.
143. "The Second Coming of the Sanitarians", National Institute of Public Health, Rennes, France, November 4th, 2009.
144. "Linking Exposure to Environmental Toxicants with ADHD in Children." Symposium on ADHD. Riyadh, Saudi Arabia, November 7th, 2009.
145. "The Interplay of Genetic and Environmental Influences in Common Conditions of Children." Macquarie University, Department of Geology, Sydney, Australia, November 18th, 2009.
146. "The Lingering Legacy of Lead Toxicity: A Call for the Global Elimination of Lead Exposure." Pacific Basin Consortium Symposium on Environment and Health, Perth, Australia, November 13th, 2009.
147. "The Second Coming of the Sanitarians", SFU President's Lecture, Simon Fraser University, Burnaby, BC, March 4th, 2010.
148. Third Annual Controversies in Pediatric Environmental Health Debate, "Should the American Academy of Pediatrics Sponsor a Ratings Board to Provide Evidence-based Ratings for Media?" A debate by James Sargent and Donald Shifrin (Bruce Lanphear, Moderator and Organizer). Pediatric Academic Societies Meeting, Vancouver, BC, May 2nd, 2010.

149. "Efficacy of Reducing Lead Hazards in Housing on Lead-Contaminated House Dust, Blood Lead Concentration and Intellectual Abilities in Children." Pediatric Academic Societies Meeting, Vancouver, BC May 1st, 2010.
150. "Protecting Children from Environmental Toxicants: The Neglected Legacy of Rachel Carson." Pediatric Grand Rounds, Cornell Weill Medical College, New York, New York. May 25th, 2010.
151. "Excavating the Enigmas of Childhood Lead Toxicity", Guest Lecturer, "Introduction to Toxicology, Harvard School of Public Health, Boston, Massachusetts, October 27th, 2010.
152. "The Conquest of Lead Poisoning: A Pyrrhic Victory", Lead Action Collaborative, New England Carpenters Center, Boston, Massachusetts, October 28th, 2010.
153. "Protecting Children from Environmental Toxicants: The Neglected Legacy of Rachel Carson." Academy of Breastfeeding Medicine, San Francisco, California, October 29th, 2010.
154. "Bisphenol A and Behavior Problems in Children". Eastern Perinatal Conference, Kingston, Ontario, November 10th, 2010.
155. "Low-Level Toxicity of Environmental Toxicants: Much Ado about Nothing?" UBC Statistics Department Seminar, November 18th, 2010.
156. "Protecting Children from Environmental Toxicants." Children's Hospital of Quebec, University of Laval, Quebec City, Quebec, December 17th, 2010.
157. "Low-level Toxicity: Implications for Research and Policy", Joint Talks by C. Arden Pope and Bruce Lanphear, SFU, UBC and UW Annual Occupational and Environmental Health Conference, Semiahmoo, WA January 7th, 2011.
158. "Crime of the Century: Lead Toxicity in the 20th Century", Panel Presentation and Discussion, UC Davis, Sacramento, California April 7th, 2011.
159. Fourth Annual Controversies in Pediatric Environmental Health Debate, "Should Parent Slather their Children with Sunscreen?" A debate with Russell Chesney, MD and Sophie Balk, MD, (Bruce Lanphear, Moderator and Organizer). Pediatric Academic Societies Meeting, Denver, Colorado, May 1st, 2011.
160. "The Conquest of Lead Toxicity: A Pyrrhic Victory", Canadian Water Network, Ecole Polytechnique de Montreal, Montreal, Canada, June 9th, 2011.
161. "The Contribution of Environmental Influences on Chronic Disease, Canadian Partnership for Health and Environment, Toronto, Canada, June 16th, 2011.
162. "The Second Coming of the Sanitarians", Environmental and Occupational Health Seminar, University of Washington School of Public Health, Seattle, WA, May 12th, 2011.
163. "Crime of the Century: The Failure to Prevent the Lead Pandemic". Sterling Prize in Controversy, Wosk Centre, Simon Fraser University, Vancouver, BC, October 19th, 2011.

164. "Measuring Exposure: The Benefits and Limits of Biomarkers". Canadian Institute for Human Development, Child and Youth Research, Montreal, Canada, December 6th, 2011.
165. "Rachel Carson: Clarity of Vision". SFU, UBC and UW Annual Occupational and Environmental Health Conference, Semiahmoo, WA, January 6th, 2012.
166. "The Truth About Toxins: What Parents and Health Professionals Should Know". Environmental Influences on Neurodevelopment: Translating the Emerging Science into Public Health Policy". UCLA School of Public Health, Los Angeles, California, January 12th, 2012.
167. "Protecting Children from Environmental Toxicants: The Neglected Legacy of Rachel Carson". Mattel Children's Hospital, Los Angeles, California, January 13th, 2012.
168. "Why Should We Share Data?", Data Sharing Strategies for Environmental Health Workshop, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, February 6th and 7th, 2012.
169. "The Science and Prevention of Lead Toxicity" (Keynote Presentation), Forum on Lead Toxicity: A Little is Still Too Much", Macquarie University, Sydney, Australia, June 5th, 2012
170. "Canada Environmental Health Atlas Knowledge Translation Workshop", Canadian Public Health Association, Edmonton, Alberta, June 13th, 2012.
171. "First Annual Controversies in Pediatric Environmental Health Debate: Should organophosphate pesticides be reduced or banned?" A debate with Brenda Eskenazi and Bruce Lanphear (Rob McConnell, Moderator). International Society for Environmental Epidemiology, Columbia, SC, August 28th, 2012.
172. "Supralinear Dose-Response Relationship of Environmental Toxicants: Research and Policy Implications." Moderator and Speaker, with Arden Pope, Roel Vermeulen and Bruce Lanphear. International Society for Environmental Epidemiology, Columbia, SC, August 29th, 2012.
173. Tanya Froehlich and Bruce Lanphear, "ADHD and Environmental Toxicants: Time for Prevention?", Society for Development and Behavioral Pediatrics, Phoenix, AZ, September 9th, 2012.
174. "The Epidemic of Childhood Disabilities: A Failure to Regulate". Workshop on Children's Rights and Corporate Responsibility, Green College, University of British Columbia, Vancouver, BC, October 19th, 2012.
175. "Low-level Toxicity: Much Ado About Nothing?", Department of Preventive Medicine Seminar, University of Southern , California, Los Angeles, California, October 23rd, 2012.
176. "Reflections on Silent Spring". (Invited Keynote). International Society for Exposure Sciences, Seattle, Washington, October 28th, 2012.

177. "Randomized Controlled Trials in Children's Environmental Health: Underutilized or Unethical?" The University of Washington Northwest Pediatric Environmental Health Specialty Unit and Center for Child Environmental Health, Seattle, Washington, February 26th, 2013.
178. "Crime of the Century: Our Failure to Prevent the Lead Pandemic". Dali Lana School of Public Health and of School Environment, University of Toronto, Toronto, Ontario, March 26th, 2013.
179. "The Ongoing Search for a Threshold". International Conference of Toxicology, Seoul, Korea, July 1, 2013.
180. "Blood Lead Concentrations and Cardiovascular Mortality in the United States: The NHANES Mortality Follow-up Cohort Study". International Society for Environmental Epidemiology, Basel, Switzerland, August 2, 2013.
181. "The Conquest of Lead Poisoning: A Pyrrhic Victory". Corporations and Global Health Governance. Simon Fraser University, Burnaby, British Columbia. September 17th, 2013.
182. "Striking at the Root: Changing the Narrative on the Causes of Disease". Corporations and Global Health Governance. Simon Fraser University, Burnaby, British Columbia. September 17th, 2013.
183. "Crime of the Century: The Failure to Prevent the Lead Pandemic". Pacific Basin Consortium, East-West Center, Honolulu, Hawaii. September 26, 2013.
184. "Low-level Toxicity: Policy Implications for the 21st Century". Symposium on Policy Implications of Environmental Exposures in the 21st Century. Pacific Basin Consortium, East-West Center, Honolulu, Hawaii. September 27, 2013.
185. "Excavating the Enigmas of Childhood Lead Toxicity". Network for Soil Contamination Research (INSCR), Delhi University, New Delhi, India. October 22nd, 2013.
186. "The Lingering Legacy of Lead Toxicity: A Call for the Global Elimination of Lead Exposure", World Health Organization, New Delhi, India. October 24th, 2013. "The Environmental Health Atlas: A Portal to Discover the Promises of Environmental Health." National Institute of Environmental Health Sciences, Raleigh-Durham, NC, November 10th, 2013.
187. "Protecting Children from Environmental Toxins". Japan Dioxin and Endocrine Disruptors Preventive Action, Tokyo, Japan, November 24th, 2013.
188. "ADHD: A Preventable Epidemic?" Alberta Children's Hospital, Calgary, Alberta, December 16th, 2013.
189. "Little Things Matter: The Impact of Toxins on the Developing Brain". Early Years Conference, Vancouver, British Columbia, January 30th, 2014.
190. "Little Things Matter: The Impact of Toxins on the Developing Brain". Dalhousie University, Halifax, Nova Scotia, March 6th, 2014.

191. "Low-level Toxicity of Environmental Toxins: Much Ado About Nothing?". Dalhousie University, Halifax, Nova Scotia, March 6th, 2014.
192. "The Canadian Environmental Health Atlas: A Portal to Discover the Promises of Environmental Health." School of Occupational and Environmental Health, University of British Columbia, March 28th, 2014.
193. "Little Things Matter: The Impact of Toxins on the Developing Brain". British Columbia Healthy Child Alliance, Vancouver, British Columbia, April 2nd, 2014.
194. "Sixth Annual Controversies in Pediatric Environmental Health Debate, E-Cigarettes: A weapon in the war against tobacco or a threat to tobacco control. (Moderator). Featuring Greg Connelly and James Sargent. Pediatric Academic Societies, Vancouver, May 4th, 2014.
195. "Striking at the Root Causes of Chronic Disease in Children" (Moderator). James Sargent, Joel Bakan and David Kessler, May 5th, 2014.
196. "Little Things Matter: The Impact of Toxins on the Developing Brain" (Keynote). OHKA Healthy Homes Alliance, Omaha, Nebraska, May 15th, 2014.
197. "Excavating environmental risk factors for autism: Suspects and strategies". A workshop on examining a multi-systems approach to autism and the environment: challenges and opportunities for research". Toronto, Ontario, June 23rd-24th, 2014.
198. "Lead Poisoning: Tackling a Global Problem" (Co-Moderator and Speaker). International Society for Environmental Epidemiology, Seattle, Washington, August 25th, 2014.
199. "Interventions to Reduce Exposures to Environmental Hazards in Pregnant Women and Children", (Moderator and Speaker). International Society for Environmental Epidemiology, Seattle, Washington, August 25th, 2014.
200. 3rd Annual ISCHE-Sponsored Debate: Should there be any restrictions on universities or academicians receiving payment from industry or other sources? (Moderator). International Society for Environmental Epidemiology, Seattle, Washington, August 25th, 2014.
201. "Crime of the Century: Our Failure to Prevent the Lead Pandemic", Tulane University School of Public Health and Tropical Medicine, New Orleans, Louisiana, September 5th, 2014.
202. "Environment Matters", Children's Environmental Health Panel. Society for Environmental Journalists, New Orleans, Louisiana, September 6th, 2014.
203. "Insidious Influence of Industry on Science: How Corporations Undermine Science", 5th Annual C. Everett Koop Distinguished Lecture, "Corporate Threats to Children's Health", with Joel Bakan and James Sargent, Dartmouth University, New Hampshire, October 6th, 2014.
204. "Crime of the Century: Our Failure to Prevent the Lead Pandemic", John Rosen Memorial Lecture, Montefiore Medical Center, New York, New York, October 8th, 2014.

205. "Little Things Matter: The Impact of Toxins on the Developing Brain" (Keynote). Prenatal Environmental Health Education (PEHE) Conference, University of Ottawa. Ottawa, Ontario, November 21st, 2014.
206. "Little Things Matter: The Impact of Toxins on the Developing Brain" (Keynote). ISEE Asian Regional Meeting, Shanghai, China, November 30th, 2014.
207. "Crime of the Century: Our Failure to Prevent the Lead Pandemic", John Rosen Memorial Lecture, ISEE Asian Regional Meeting, Shanghai, China, November 31st, 2014.
208. "Data Visualization", with Joe Braun and Allan Just, Pediatric Environmental Health Scholars Retreat, Reston, VA, December 6th, 2014.
209. "Victories in Public Health: Progress or Adaptation?" SFU, UBC and UW Annual Occupational and Environmental Health Conference, Semiahmoo, WA January 8th, 2015.
210. "Food in the Industrial Era: Is Backward the Way Forward?" Children's Environmental Health Network, Austin, Texas, February 4th, 2015.
211. "Excavating the enigmas of childhood lead toxicity". Broken Hill City Council and Lead Reference Group, Broken Hill, New South Wales, Australia, March 3rd, 2015.
212. "Prevention Paradox: Why a Little Lead is Too Much". Unequal Exposure Symposium, Climate Change Research Center, University of New South Wales, March 5th, 2015, Sydney, Australia.
213. "Crime of the Century: Our Failure to Prevent the Lead Pandemic". 10th Annual Break the Cycle Conference, Emory University, Atlanta, Georgia. April 23rd, 2015.
214. "The Staggering Cost of Lead Toxicity and the Unbelievable Benefit of Preventing It". 10th Annual Break the Cycle Conference, Emory University, Atlanta, Georgia. April 24th, 2015.
215. Seventh Annual Controversies in Pediatric Environmental Health Debate, "GMOs: A Hazard or Harvest of Health?" A debate with Joel Forman, MD and Daniel Goldstein, MD, (Bruce Lanphear, Moderator and Organizer). Pediatric Academic Societies Meeting, San Diego, California, April 27th, 2015.
216. "Impact of Dwellings on Child Health", Canadian Green Building Council Conference, Vancouver Convention Center, Vancouver, BC, April 28. 2015.
217. "Impact of Tobacco on the Developing Brain", Developmental Effects of Nicotine and Implications for Emerging Tobacco Products, Rockville, Maryland, May 5th, 2015.
218. "Impact of Toxins on the Developing Brain" India Tour (Bengaluru, Trivandrum, Kolkata, and Chandigarh) Sponsored by PAN-India, September 4th-11th, 2015.
219. "Impact of Dwellings on Child Health", Green School Summit, Calgary, Alberta, September 25th. 2015.

220. "Prevention Paradox: Why a Little Lead is Too Much", A debate with George Rhoads, Montefiore Medical Center, Tarrytown, October 2nd, 2015.
221. "Crime of the Century: Our Failure to Prevent the Lead Pandemic" (Keynote Presentation), University of Cincinnati Department of Environmental Health 50th Anniversary Gala, Cincinnati, Ohio, October 9th, 2015.
222. "Impact of Toxins on the Developing Brain" (Keynote Presentation) Children's Environmental Health Centers Annual Meeting, Washington, DC, October 31, 2015.
223. "The Impact of Toxins on the Developing Brain: Our Failure to Prevent Brain-based Disorders in Children", National Core for Neuroethics, UBC November 12th, 2015.
224. "Impact of Dwellings on Child Health", Canada Green Building Council, Toronto, ON Green, December 1st, 2015.
225. "The Tortuous Road to Prevention: Are We There Yet", Air Quality and Impacts on Health: Beyond the Heart and the Lungs, The Lung Association of BC, February 28th, 2016.
226. "Lead's Long Shadow: What the Story of Flint, Michigan Means for All of Us", with Bruce Lanphear, Mona Hanna-Attisha and Marc Edwards. Collaborative on Health and the Environment Webinar, March 8th, 2016.
227. "Little Things Matter: The Impact of Toxins on the Developing Brain", Collaborative on Health and Environmental Alaska Working Group Webinar, March 9th, 2016.
228. "Victories in Public Health: Progress or Adaptation?", Symposium Against Indifference, Ashland University, Ashland, Ohio, April 5th, 2016.
229. "Little Things Matter: The Impact of Toxins on the Developing Brain" (Keynote), Children's Environmental Health: New Findings from California Research, Sacramento, California, April 7th, 2016.
230. "Crime of the Century: Our Failure to Prevent the Lead Pandemic", Distinguished Visiting Professor in Health Law, Loyola University, Chicago, Illinois April 21st, 2016.
231. "The Population Impact of Toxins on Intellectual Abilities: Implications for Policy and Prevention", in Symposia on Environmental Toxins and the Brain: Growing Evidence of Risk, Pediatric Academic Societies, Baltimore, MD, May 2nd, 2016.
232. "Data Visualization and Video Production for Public Consumption", in Symposia on Innovative Tools to Enhance Knowledge Translation of Environmental Health: Data Visualization, Videos and Message Mapping, (co-Moderated by Mark Miller and Bruce Lanphear), Pediatric Academic Societies, Baltimore, MD, April 30th, 2016.
233. "Crime of the Century: Our Failure to Prevent the Lead Epidemic", Michigan State University, Flint, MI, May 7th, 2016.

234. "Crime of the Century: Our Failure to Prevent the Lead Epidemic", Johns Hopkins University School of Public Health, Baltimore, MD, May 7th, 2016.
235. "Little Things Matter: The Impact of Toxins on the Developing Brain", Baltimore, MD, International Medical Federation Autism Research (IMFAR), May 8th, 2016.
236. "Public Health Matters: Videos on Toxic Chemicals, Air Pollutants and the Prevention Paradox", Mongolian National University of Medical Sciences, June 23, 2016.
237. "Little Things Matter: The Impact of Toxins on the Developing Brain", USC Annenberg Center for Health Journalism, July 18th, 2016.
238. "Preventing Lead Toxicity", California Environmental Protection Agency, Occupational Environmental Health Hazard Assessment, September 23rd, 2016.
239. "Unleashing the Power of Prevention: Creating Video to Re-Imagine our Approach to Disease," World Issues Forum, Fairhaven College, University of Western Washington, (with Bob Lanphear), November 2, 2016.
240. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", Pediatric Grand Rounds, Maimonides Hospital, November 15th, 2016.
241. "Little Things Matter: The Impact of Toxic Chemicals on the Child Health" (Keynote), Hudson Valley Perinatal Conference, November 16th, 2016.
242. "Little Things Matter: The Impact of Toxins on the Developing Brain", IPEN, San Francisco, CA, November 18th, 2016.
243. "Unleashing the Power of Prevention: Creating Video to Re-Imagine our Approach to Disease", SFU, UBC and UW Annual Occupational and Environmental Health Conference Semiahmoo, WA, January 5th, 2017.
244. "Unleashing the Power of Prevention: Creating Video to Re-Imagine our Approach to Disease", University of New Brunswick, January 25th, 2017.
245. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", New Brunswick Children's Environmental Health Collaborative, January 26th, 2017.
246. "Unleashing the Power of Prevention: Creating Video to Re-Imagine our Approach to Disease", Rockefeller Center, Bellagio, Italy, February 22nd, 2017.
247. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", The Science in Society Speaker Series, Okanagan College, Vernon, BC, April 6th, 2017.
248. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain" (invited plenary), Vancouver, British Columbia, Canadian Pediatric Society, June 3rd, 2017.
249. "Unleashing the Power of Prevention: Creating Video to Re-Imagine our Approach to Disease", Macquarie University, Sydney, Australia, September 29th, 2017.

250. "Unleashing the Power of Prevention: Creating Video to Re-Imagine our Approach to Disease", Brown University, Providence, Rhode Island, October 13th, 2017.
251. Cause or Cure: Does the Relentless Pursuit of a Cure Endanger our Health? University of Alaska, Alaska Tribal Health Consortium, Anchorage, Alaska, November 2nd, 2017.
252. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain" (Keynote), All Alaska Pediatric Conference, Anchorage, Alaska, November 3rd, 2017.
253. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", CINBIOSE 30th Anniversary, University of Quebec at Montreal, Montreal, November 9th, -10th, 2017.
254. "The Legacy of Lead Poisoning: Moving towards Prevention". East Chicago Community Meeting, Illinois, November 26th, 2017.
255. "Cause or Cure", NIEHS Environmental Health Seminar, University of Southern California, Los Angeles, California, December 1st, 2017.
256. "Little Things Matter: The Impact of Lead on Brain Development" (Keynote Presentation), Workshop on Lead-Free Schools, Pew Trust, Washington, DC, December 6th-7th, 2017.
257. "Low-level Toxicity of Chemicals: No Acceptable Threshold?" Risk Modeling, Mitigation and Modeling in Health Sciences, Centre de Recherches Mathematiques, Montreal, QC, December 11th, 2017.
258. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", Department of Psychology and Neuroscience, York University, Toronto, ON, December 13th, 2017.
259. "The impact of Pollutants on Human Health: No Safe Levels?", Center for Energy and Environmental Contaminants, Macquarie University, Sydney, Australia, February 13th, 2018.
260. "Cause or Cure: Does the Relentless Pursuit of a Cure Endanger our Children's Health?", Department of Pediatrics, University of Wisconsin at Madison School of Medicine, Madison, Wisconsin, March 1st, 2018.
261. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", Wisconsin Environmental Health Network, Madison, Wisconsin, March 2nd, 2018.
262. "Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain", Biennial Atlantic Symposium on Learning Disabilities Association, Fredericton, NB.
263. "Crime of the Century: The Failure to Prevent the Lead Pandemic" (Keynote). 11th UK and Ireland Environmental and Occupational Epidemiology, John Snow Lecture Hall, London School of Hygiene and Tropical Medicine, April 27th, 2018.
264. "The Impact of Pollutants on Human Health: No Safe Levels?" From Toxicology to Planetary Health, London School of Hygiene and Tropical Medicine, April 27th, 2018.

265. Topic Symposium: “Toxic Chemicals and the Rise of Chronic Disease in Childhood: A Preventable Epidemic?” (chair and speaker), Pediatric Academic Societies, May 7th, 2018.
266. “Prevention Paradox; Why a Little Lead is Too Much”, Ontario Water Advisory, Toronto, CA, May 7th, 2018.
267. “How the Secrets of Body Care and Cleaning Products Impact your Health”, Panel with Bruce Lanphear, Muhannad Malas and Janie McConnell, Centre for Free Expression, Ryerson University, Toronto, ON, May 7th, 2018.
268. “Prevention Paradox; Why a Little Lead is Too Much” (Keynote), Pittsburgh, PA, Get the Lead Out Conference, May 9th, 2018.
269. “Low-level Lead Exposure and Mortality”, Global Health Forum, Miami, FL, May 23rd, 2018.
270. “Unleashing the Power of Prevention: Targeting Toxic Chemicals and Pollutants”, Canadian Public Health Association, Montreal, QC, May 28th, 2018.
271. “The Impact of Pollutants on Human Health: No Safe Levels?” Chemicals Management Plan Stakeholder Advisory Council, Health Canada, May 30th, 2018.
272. “Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain”, Pediatric Grand Rounds, University of California – Davis, Sacramento, CA, June 8th, 2018.
273. “Why a Little Lead is Too Much”, Health Canada, Ottawa, ON, August 29th, 2018.
274. “Unleashing the Power of Prevention: Mobilizing Science to Prevent Disease”, ISEE-ISES Workshop, Ottawa, ON, August 30th, 2018.
275. “The Lingering Legacy of Lead: Why a Little Lead is Too Much”, LA Lead Summit: A Strategy for Prevention, University of Southern California, September 14th, Los Angeles, CA.
276. “Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain”, Children’s Hospital of Orange County, Orange County, CA, September 19th, 2018.
277. “The Lingering Legacy of Lead: Why a Little Lead is Too Much”, Hurley Medical Center, Flint, Michigan, October 3rd, 2018.
278. “Lead and The Mysterious Decline in Coronary Heart Disease”, National Institute of Occupational Safety and Health, Cincinnati, OH, October 11, 2018.
279. “Little Things Matter: The Impact of Toxic Chemicals on the Developing Brain”, Grand Rounds, Oregon State Health University, Portland, OR, October 23, 2018.
280. “The Impact of Pollutants on Human Health: No Safe Levels?” Oregon Environmental Council, Portland, OR, October 23, 2018.
281. “Little Things Matter: The Impact of Toxic Chemicals and Organic Food on Children’s Health”, HIPP Scientific Symposium on Organic Food, Kranzberg, Germany, October 30, 2018.

282. “The Mysterious Decline in Coronary Heart Disease”, Harvard University Lead Summit, Cambridge, MA, November 15th, 2018.
283. “The Impact of Pollutants on Human Health: No Safe Levels?” Department of Epidemiology, UMass, Amherst, MA, November 16th, 2018.
284. “Little Things Matter: The Impact of Toxic Chemicals on Human Health”, School of Public Health, Oregon State University, Corvallis, Oregon, April 12th, 2019.
285. Why A Little Lead is Too Much: An Intimate History”, “The Impact of Pollutants on Human Health: No Safe Levels?”, Graduate Course in Environmental Health, School of Public Health, University of California, Berkeley, April 17th, 2019.
286. “The Impact of Pollutants on Human Health: No Safe Levels?”, Department of Environmental Health, School of Public Health, University of California, Berkeley, April 17th, 2019.

Grants

Active Grant Awards

1. Consultant (Joseph Braun, PI). Early Life Perfluoroalkyl Substance Exposure and Obesity: Mechanisms and Phenotyping. 02/01/2016-01/31/2021. National Institutes of Health, \$523,725 (5% effort). The purpose of this award is to study the impact of exposure to perfluoroalkyl chemicals on the development of child obesity, adverse cardiometabolic markers and gene regulation. (2.5% effort)
2. Co-Applicant (Linda Booij, Maryse Bouchard PI). In utero exposure to Bisphenol-A and the developing brain in humans: A longitudinal study of epigenetic mechanisms. 03/01-2016 – 03/31/2019. Canadian Institutes of Health Research (CIHR), \$344,025. (2.5% effort).
3. Principal Investigator (Multiple PI Award with Christine Till). “Impact of early life fluoride exposure on cognitive and behavioural outcomes in children”. NIEHS, 09/30/16 – 05/01/19, \$296,683 (10% effort).
4. Consultant (Aimin Chen, Principal Investigator). Developmental neurotoxicity of organophosphate and novel brominated flame retardants in children. National Institute for Environmental Health Sciences. 1RO1ES028277. 09/30/2017-06/30/22 (10% effort).
5. Mentor (Cynthia Curl, Principal Investigator). Measurement of Agricultural and Dietary Glyphosate Exposure among Pregnant Women. National Institutes of Environmental Health Sciences. 1KO1ES028745-01A1. 09/01/2018-08/31/2022 (5% effort).

Past Grant Awards

1. Principal Investigator, "Dust-Lead and Blood Lead Levels among Urban Children". The National Center for Lead-Safe Housing, \$561,619, 06/15/93 to 08/31/94. Department of Housing and Urban Development Contract MDLPT0001-93. (25% effort).
2. Principal Investigator, "Determinants of Lead Exposure among Children in Monroe County, NY", NIEHS Pilot Grant, University of Rochester School of Medicine and Dentistry, Department of Environmental Medicine. \$7,600, 06/15/93 to 12/31/95. (0% effort)
3. Principal Investigator, "The Effectiveness of Dust Control in Reducing Children's Blood Lead Levels" U.S. Department of Housing and Urban Development, \$128,394, 04/01/94 to 05/30/95. (25% effort).
4. Principal Investigator, "Primary Prevention of Exposure to Lead". Centers for Disease Control and Prevention, \$832,228, 09/30/94 to 10/01/98. (25% effort)
5. Principal Investigator, "Lead-Contaminated House Dust and Children's Blood Lead Levels". National Center for Lead-Safe Housing, \$43,260, 10/01/96 to 03/30/96. (25% effort).
6. Co-investigator (Christy, PI), "Tuberculosis Screening in Children". New York Department of Health, \$15,000, 01/01/95 to 12/31/96. (0% effort)
7. Co-investigator (Weitzman, PI), "Fellowship Training in General Pediatrics" (Grant # D28PE50008). Bureau of Health Professions, HRSA, U.S. Public Health Service, \$1,752,816, 06/01/96 to 05/30/97. (10% effort).
8. Principal Investigator, "Neurobehavioral Effects of Low-Level Childhood Lead Exposure". University of Rochester School of Medicine & Dentistry, \$8,560, 06/01/96 to 05/30/97. (0% effort)
9. Principal Investigator, "Neurobehavioral Effects of low-level Lead Exposure in Children". NIEHS Pilot Grant, University of Rochester Department of Environmental Medicine, \$20,035, 09/01/97 to 08/30/97. (0% effort).
10. Co-investigator (Howard, PI), "Effect on Breastfeeding of Pacifiers and Bottle Feeding". Bureau of Maternal and Child Health, \$420,333, 10/01/96 to 09/30/00. (2.5% effort)
11. Co-investigator (Canfield, PI) "Lead and Children's Cognitive Functioning", Research Grants Program, Cornell University. \$17,000, 10/01/96 to 09/31/97 (0% effort).

12. Principal Investigator, "Neurobehavioral Effects of Low-Level Lead Exposure in Children" (RO1-ES 08338). National Institute of Environmental Health Sciences, 12/01/96 to 11/31/01, \$1,946,848. (25% effort).
13. Co-investigator, (Aligne, PI). "Reduction in Passive Smoking among Children with Asthma: A Randomized Trial of HEPA Air Filtration." 10/01/96 to 09/31/97, \$6,000. KIDD Grant, Rochester General Hospital (0% effort).
14. Co-investigator, (DeWitt, PI). "Faculty Development in General Pediatrics". Bureau of Health Professions, Health, Department of Health and Human Services 07/01/97 to 06/30/00, \$338,000. (15% effort).
15. Principal Investigator, "A Side-by-Side Comparison of Allergen Sampling Methods", U.S. Department of Housing and Urban Development, 01/02/98 to 12/31/98, \$163,065. (15% effort).
16. Principal Investigator, "National Research Service Award - Fellowship Training in General Pediatrics and Adolescent Medicine" (1T32PE10027), Health Resources and Services Administration, DHHS. 07/01/98 to 06/30/03. \$634,408. (0% effort).
17. Co-investigator, (Steiner, PI) "Survey of Directors and Graduates of NRSA Fellowship Training Programs", Health Resources and Services Administration, Department of Health and Human Services. 06/01/98 to 06/30/99.
18. Principal Investigator, "Effect of Soil Remediation on Children's Blood Lead Levels in Midvale, Utah". U.S. Environmental Protection Agency, 08/01/98 to 07/30/99. \$62,550. (15% effort).
19. Co-investigator, (Phelan, PI) Trends and Patterns in Playground Injuries among U.S. Children." Ambulatory Pediatric Association, 05/05/99 to 05/04/00. \$9,000 (0% effort).
20. Principal Investigator, "Risk Assessment for Residential Lead Hazards". U.S. Department of Housing and Urban Development, 09/01/99 to 08/30/00. \$102,435. (25% effort).
21. Principal Investigator, "Residential Exposures associated with Asthma in U.S. Children and Adolescents" U.S. Department of Housing and Urban Development, 07/16/99 to 03/15/00. \$30,400. (20% effort).
22. Principal Investigator, "Effectiveness of Lead Hazard Control Interventions – A Systematic Review" National Center for Lead-Safe Housing, 10/01/99 to 06/01/00. \$22,500 (10% effort).
23. Principal Investigator, "Racial Disparity in Blood Lead Levels due to Genetic Variation in Calcium Absorption". NIEHS Pilot Grant, Center for Environmental Genetics, University of Cincinnati, 04/01/00 to 03/31/01. \$28,130 (0% effort).
24. Principal Investigator, "International Pooled Analysis of Prospective, Lead-Exposed Cohorts". National Institute of Environmental Health Sciences, National Institutes of Health, 08/15/00 to 09/14/01, \$16,000. (2.5% effort).

25. Principal Investigator, "A Randomized Trial to Reduce ETS in Children with Asthma" (RO1-HL/ES65731). National Heart, Lung and Blood Institute, National Institutes of Health, 09/29/00 to 09/28/04, \$1,546,848. (25% effort).
26. Co-investigator, (Geraghty, PI) "Breastfeeding Practices of Mothers of Multiples". Ambulatory Pediatric Association, 05/01/01 to 04/30/02. \$5,000 (0% effort).
27. Principal Investigator (Subcontract), "A Longitudinal Study of Lead Exposure and Dental Caries". National Institute of Dental and Craniofacial Research, National Institutes of Health, 08/01/01 to 07/30/04. \$300,000 (10% effort).
28. Co-investigator (Phelan, PI), "Fatal and Non-Fatal Residential Injuries in U.S. Children and Adolescents" U.S. Department of Housing and Urban Development, 03/01/01 to 11/31/01. \$40,700. (5% effort).
29. Principal Investigator, "Prevalent Neurotoxicants in Children" (PO1-ES11261). National Institute for Environmental Health Sciences and U.S. Environmental Protection Agency, 09/01/01 to 09/31/06, \$5,000,000. (30% effort).
30. Principal Investigator, "International Pooled Analysis of Lead-Exposed Cohorts". Centers for Disease Control (RO1/CCR 521049). Centers for Disease Control, 09/15/01 to 09/14/02, \$28,473. (3% effort).
31. Principal Investigator, supplement to "Prevalent Neurotoxicants in Children" (PO1-ES11261). NIEHS, 09/01/02 to 09/31/07, \$1,800,000. (10% effort).
32. Co-Investigator, "ADHD Phenotype Network: Animal Model to Clinical Trial". National Institute of Neurologic Diseases, 09/15/02 to 06/30/05 (15% effort).
33. Principal Investigator, "Linkage of ADHD and Lead Exposure", Springfield, Ohio Department of Health, 02/01/03 to 06/01/04, \$25,000. (0% effort).
34. Co-investigator (Yolton, PI) "Explorations of ETS Exposure on Child Behavior and Sleep" NIEHS, 04/01/04 to 03/30/06, \$300,000. (5% effort).
35. Co-investigator (Haynes, PI) "MRI as a Biomarker of Manganese Exposure". NIEHS, 09/01/04 to 08/30/06, \$300,000. (5% effort).
36. Co-investigator (National Center for Healthy Housing, PI) "Development of a Standardized Housing Assessment for Asthma", U.S. Department of Housing and Urban Development, 11/01/05 to 10/31/07, \$50,000. (5% effort).
37. Co-Investigator (Hershey, PI) "Epithelial Genes in Allergic Inflammation" National Institutes of Allergy and Infectious Diseases", 07/01/06 to 06/30/07, \$4,787,541. (3% effort).

38. Co-Investigator and Mentor (Wilson, PI), "Racial Difference in DNA Adducts in Tobacco-Exposed Children". Dean's Scholar Award, University of Cincinnati, 02/22/06 to 01/21/09, \$150,000 (5% effort).
39. Principal Investigator, "National Research Service Award - Fellowship Training in Primary Care Research," (1T32PE10027), Health Resources and Services Administration, DHHS. 07/01/98 to 06/30/08. \$1,600,000. (0% effort).
40. Co-Investigator and Mentor (Kahn, PI). "Childhood Asthma in an Era of Genomics: Will the Generalist's Role be Recast?" Robert Wood Johnson Generalist Physician Faculty Scholars Program" 06/01/04 to 05/30/08, \$300,000.
41. Co-Investigator and Mentor (Spanier, PI), "Exhaled Nitric Oxide to Manage Childhood Asthma". National Heart, Lung and Blood Institute, 07/01/06 to 06/31/08, \$200,000 (10% effort).
42. Co-investigator (Sub-Contract PI), BYPL Vanguard Center (Specker, Principal Investigator), "National Children's Study", National Institute for Child Health and Development, 11/01/05 to 10/31/10, \$500,000. (20% effort). [Relinquished with relocation to SFU].
43. Associate Director and Co-Investigator, (Ho, PI). "Center for Environmental Genetics," NIEHS, 04/01/08 to 3/31/13, \$1,000,000 (10% effort). [Relinquished with relocation to SFU.]
44. Co-Investigator (Yolton, PI). "Tobacco Smoke and Early Human Behavior". Clinical Innovator Award, Flight Attendant Medical Research Institute", 07/01/07 to 06/30/10, \$300,000. (3% effort).
45. Co-Investigator (Spanier, PI). "Low Level Prenatal Tobacco Exposure and Infant Wheeze." Young Clinical Scientist Award, Flight Attendant Medical Research Institute, 07/01/07 to 06/30/12, \$300,000. (5% effort).
46. Co-Investigator and Mentor (Spanier, PI). K23, "Prenatal Low Level Tobacco & Phthalate Exposure and Childhood Respiratory Health". National Institute for Environmental Health Sciences, 12/1/07 to 11/30/12, \$623,679 (0% funded effort).
47. Co-investigator (Yolton, PI). "Neurobehavioral effects of insecticide exposure in pregnancy and early childhood." NIEHS, 09/01/09 to 08/31/12.
48. Principal Investigator (Bruce Lanphear, PI), "A Community-Based Trial to Prevent Lead Poisoning and Injuries," National Institute for Environmental Health Sciences, 04/01/07 to 03/30/13, \$2,000,000. (25% effort).
49. Co-Investigator (Kim N. Dietrich, PI). "Early Lead Exposure, ADHD & Persistent Criminality: Role of Genes & Environment," National Institute for Environmental Health Sciences, 04/01/07 to 3/31/2013, \$1,250,000. (2.5% funded effort).

50. Co-Investigator and Sub-Contract PI (Brenda Eskenazi, PI). This supplemental award was to conduct a pooled analysis of prenatal organophosphate pesticide exposures with birth outcomes and neurodevelopment in children using 4 US birth cohorts. NIEHS, 09/01/2009 to 08/31/2013, \$96,000 (0% effort).
51. Mentor and Supervisor (Glenys Webster, PI). Michael Smith Foundation for Health Research Postdoctoral Training Award, 03/01/12 to 02/28/15, \$134,500 (5% effort).
52. Co-Principal Investigator (Tye Arbuckle, PI). Maternal-Infant Research on Environmental Chemicals: Effects on Child Development (MIREC-CD). 06/26/11 to /5/25/14, Health Canada Chemical Management Program, \$283,000 (10% effort).
53. Co-Investigator (Patti Dods and Amanda Wheeler, co-PIs). Phthalate Exposure and the development of asthma in the CHILD Study. 06/01/11 to 05/30/14, Health Canada Chemical Management Program, \$204,000 (5% effort). Consultant (Stephanie Engel, PI). A pooled investigation of prenatal phthalate exposure and childhood obesity. 11/01/2012 – 10/31/15, NIEHS. \$275,000. (5% effort).
54. Co-Investigator (Ryan Allen, PI). A randomized air filter intervention study of air pollution and fetal growth in a highly polluted community. 06/08/2012 – 05/30/15, CIHR \$348,000 (10% effort).
55. Co-Investigator (William Fraser and Tye Arbuckle, co-PIs). MIREC-CD Biomonitoring Study in Vancouver. 09/01/2013 – 08/30/2014. Health Canada, \$120,138 (10% effort).
56. Principal Investigator. Knowledge translation tools for capacity building for an online Canadian Environmental Health Atlas. 03/01/12 – 02/28/13, Canadian Institutes of Health Research, \$98,974 (10% effort).
57. Principal Investigator (with Lawrence McCandless). Prenatal exposure to environmental contaminants and fetal growth: How to account for multiplicity when testing multiple statistical hypotheses?. 07/01/2015-06/30/2016. Canadian Institutes of Health Research (CIHR), \$12,000 (5% effort).
58. Principal Investigator, Canadian Environmental Health Atlas Knowledge Translation to produce videos and interactive tools. 06/01/2015-07/30/2016. Canadian Internet Registration Authority, \$50,000 (10% effort).
59. Co-Investigator (Kieran Phelan, PI). “Injury Prevention in a Home Visitation Population”. NICHD, 09/28/10 to 07/31/16, \$2,000,000 (total direct costs over 5 years) (10% effort).
60. Co-applicant (Timothy F. Oberlander, PI). Developmental origins of autism: A population level linked data study of prenatal antidepressant medication exposure. 09/01/2013 – 09/31/2016, Canadian Institutes of Health Research (CIHR), \$285,768.

61. Principal Investigator (Multiple PI Award with Aimin Chen and Kimberly Yolton).
“Longitudinal study of exposures to PBDEs and PFCs and child behavior”. NIEHS,
04/30/11 – 05/01/17, \$2,150,000 (total direct costs over 5 years) (20% effort).
62. Principal Applicants (McCandless and Lanphear). Biostatistical methods for estimating the
cumulative impact of environmental contaminant exposures on preterm birth. Canadian
Institute for Human Development, Child and Youth Health. 12/06/16-12/05/18, \$200,000
(10% effort).
63. Co-investigator (Ryan Allen, PI). Randomized Interventions to Evaluate the Effects of Air
Pollution Exposure on Children's Health and Development. 03/01/2015 – 03/31/2019,
Canadian Institutes of Health Research (CIHR), \$720,535. (10% effort)
64. Co-investigator (Joseph Braun, PI). Endocrine Disrupting Chemicals, Thyroid Hormones
and Child Neurobehavior. 06/01/2015-03/31/2019. National Institutes of Health, \$471,241
(5% effort). The purpose of this study is test if and when early life exposures to phthalates,
triclosan, or bisphenol A adversely impacts children’s cognition and behavior.
- 65.

Ethics Training for Research

CITI (Collaborative Institutional Training Initiative) (Reference# 7159023). Academic and Regional
Health Centers Curriculum Course, completed on December 16th, 2011.

CITI (Collaborative Institutional Training Initiative) (Reference# 7160515), Canada GCP Curriculum
Course, completed on December 16th, 2011.

CITI (Collaborative Institutional Training Initiative) (Reference# 8316270), Human Subjects Core
Curriculum, completed on August 17th, 2012.

CITI (Collaborative Institutional Training Initiative) (Reference# 13561457), Academic and Regional
Health Centers Core Curriculum, completed on September 1st, 2014.

CITI (Collaborative Institutional Training Initiative) (Reference# 16954900), Human Subjects Research
Core Curriculum, completed on October 31st, 2015.