

**APRIL 24-25, 2017**

**Emory University**  
**Health Research Sciences Building**  
**Rollins Auditorium, 1st Floor**  
**1760 Haygood Drive, Atlanta, GA 30322**

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**Monday April 24, 2017**

**8:30 AM Registration & Breakfast**

**9:00 AM Opening of Program**

Robert Geller, MD, Director, Southeast PEHSU, Professor of Pediatrics, Emory University, Atlanta GA

**9:10 AM Message from the ATSDR**

Michael Hatcher, DrPH, Chief, Environmental Medicine Branch, Division of Toxicology and Human Health Sciences, ATSDR, CDC, Atlanta GA

**9:20 AM Message from the EPA**

Ruth Eztel, MD, PhD, Director of the Office of Children's Health Protection, United States Environmental Protection Agency, Washington DC

**9:40 AM Introduction to Break the Cycle**

Leslie Rubin, MD, Director, Break the Cycle Program, Associate Professor, Morehouse School of Medicine, Co-Director Southeast PEHSU, Atlanta GA

**10:00 AM Home, Belonging and the Incarcerated Mother: A study on the effects of mass incarceration on children's behavioral health outcomes**

Tatenda Mangurenje, student, Peter Brown, PhD, mentor, Departments of Anthropology and Global Health, Emory University, Atlanta GA

**10:20 AM Factors affecting the length of stay in drug exposed infants admitted to the Neonatal Intensive Care Unit**

Pratibha Agarwal, MD, student, David Wood, MD, MPH, mentor, Department of Pediatrics, East Tennessee State University, Johnson City TN

**10:40 AM Health Break**

**11:10 AM Impact of early life housing on child behavior at age seven**

Abby Gaylord, student, Julie Herbstman, PhD, Department of Environmental Health Sciences, Mailman School of Public Health, Columbia University, New York City NY

**11:30 AM A Silver Lining for High-Risk Infants: Coordinated Care for Children 0-32 Months**

Lea Redd, student, Bree Andrews, MD, MPH, Department of Pediatrics—Neonatology, The University of Chicago Medical Center, Chicago IL

**11:50 AM Lunch**

\$10 Optional lunch if reserved at registration– We encourage you to stay and network with presenters and attendees

- 1:30 PM      Neurodevelopmental Outcomes of Recent Exposure to DDT in Children of Selected Communities of Zambia**  
Nosiku Munyinda, student, Charles Michelo, BSc, MBChB, MPH, MBA, PhD, Mentor, Department of Public Health, University of Zambia, Lusaka, Zambia
- 1:50 PM      Racial Disparities in Access to Municipal Water Supplies in the American South: Impacts on Children's Health**  
Frank Stillo, student, Jackie McDonald Gibson, PhD, mentor, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill NC
- 2:10 PM      KEYNOTE SPEAKER**  
**Environmental Justice Research Roadmap: Science and Scientific Gaps to Help Address Different Aspects of Environmental Justice**  
Andrew Geller, PhD, MS Deputy Director, United States Environmental Protection Agency, Sustainable and Healthy Communities Research Program, Washington DC
- 2:30 PM      Health Break**
- 3:00 PM      Interactive Educational Lead Hazards Class to Children at the Boys and Girls Club in Metro Atlanta - Pilot**  
Catherine Evans, Amrita Mahtani, Sam Peters, Patrick Fueta, students; W. Michael Caudle, PhD, mentor, Department of Environmental Health, Rollins School of Public Health, Emory University, Atlanta GA
- 3:20 PM      The Role of Social Support and Adolescent's Mothers Breastfeeding Practices in North Carolina**  
Colleen Clark, student, Kimberly Price, PhD, MCHES, mentor, Public Health Program, Center for Graduate Studies at Asheville, Lenoir-Rhyne University, Asheville NC
- 3:50 PM      The Effectiveness of a Community-Based Program of Nutrition Education and Physical Activity to Decrease Health Disparities of Childhood Obesity**  
Hope Bentley, student, Jannett Lewis-Clark, MOT, OTD, OTR/L, CLT, mentor, Department of Nursing and Allied Health, College of Veterinary Medicine, Tuskegee University, Tuskegee AL
- 4:10 PM      Urban Farming as a Model for Positive Youth Development**  
Luis Torres, student, Cappy Collins, MD, mentor, Department of Public Health, Icahn School of Medicine at Mt. Sinai, New York City NY
- 4:30 PM      Review and Conclusion**  
Leslie Rubin, MD
- 5:00 PM      Adjourn**



**Tuesday, April 25, 2017**

**Resilience: The Phenomenon of Overcoming Adversity**

**8:00 AM Registration & Breakfast**

**8:30 AM Introduction**

Leslie Rubin MD, Director, Break the Cycle Program, Associate Professor, Morehouse School of Medicine, Co-Director Southeast PEHSU, Atlanta GA

**8:50 AM Started from the Bottom: My Resilience Story**

Natalie Hernandez, PhD, M.P.H., Assistant Professor, Prevention Research Center, Post-Doc Fellow, Center of Excellence on Health Disparities, Department of Community Health and Preventive Medicine, Morehouse School of Medicine, Atlanta GA

**9:10 AM Those Kind of People**

Jessica Spraggins, M.P.H., CCPH Health Education Specialist, Division for Heart Disease and Stroke Prevention (DHDSP), Centers for Disease Control (CDC), Atlanta GA

**9:30 AM Experience, Strength, and Hope**

Lucy Hall, B.S., NCAC, and CASAC, CEO and Founder, Mary Hall Freedom House, Atlanta GA

**9:50 AM Resilience: An Anthropological Perspective**

Mel Konner, MD, PhD, Samuel Candler Dobbs Professor, Department of Anthropology, Program in Neuroscience and Behavioral Biology, Emory University, Atlanta GA

**10:10 AM Challenges to Work Groups**

Leslie Rubin, MD

**10:15 AM Health Break**

**10:30 AM Group Discussions**

**11:45 AM Feedback from Groups and Conclusion**

**12:30 PM Adjourn**



**Michael T.  
Hatcher, Dr. PH**

Dr. Michael Hatcher is a public health professional with more than 39 years of health promotion and disease prevention experience at the local, state, and federal levels of public health. He has led health promotion and disease prevention planning, initiative development, and implementation of interventions that resulted in measurable population-level health improvements.

His achievements include articulating the *Principles of Community Engagement*, redefining public health practice through the *Essential Public Health Services* and *National Public Health Performance Standards*, which have improved health system operation and performance improvement. He has also conducted health services research at the interface of population health and personal health care services.

Dr. Hatcher has served as chief for the environmental medicine branch at ATSDR for nearly 14 years and has facilitated expansion of the Pediatric Environmental Health Specialty Units' work to include protecting expectant mothers and children at their earliest stages of development from hazardous substances in the environment.



**Ruth Etzel,  
M.D., Ph.D.**

Dr. Ruth A. Etzel is Director of the U.S. Environmental Protection Agency's Office of Children's Health Protection. She received her PhD in Epidemiology from the University of North Carolina Chapel Hill School of Public Health. She was a pioneer in studying the health effects of exposure to secondhand smoke among infants; her work led to nationwide efforts to reduce indoor exposures to tobacco, including the ban on smoking in US airliners.

Dr. Etzel is the founding editor of the influential book *Pediatric Environmental Health* (a 4th edition will be published in 2018). This book has helped to train thousands of doctors who care for children about how to recognize, diagnose, treat and prevent illness among children from hazards in the environment. She co-edited the *Textbook of Children's Environmental Health*, published in 2014. Dr. Etzel served as the Senior Officer for Environmental Health Research at the World Health Organization from 2009 to 2012. In the U.S. she has served in numerous public-sector leadership positions including: Centers for Disease Control and Prevention (Founding Chief of the Air Pollution and Respiratory Health Branch), Department of Agriculture (Director of the Division of Epidemiology and Risk Assessment) and Indian Health Service (Research Director at the Alaska Native Medical Center).

She is a courageous leader in bringing health risks to children to public attention and working collaboratively towards solutions.



**Andrew Geller,  
Ph.D., M.S.**

Dr. Andrew Geller is the Deputy National Program Director for EPA's Sustainable and Healthy Communities (SHC) Research program and lead author on EPA's Environmental Justice Research Roadmap. Dr. Geller led SHC's strategic planning effort to develop the Office of Research and Development's research focused on providing science and tools to help communities identify and reach sustainability goals.

Dr. Geller's research has included the development of community and tribal decision support tools, the impacts of environmental exposures on older adults, and efforts in neurotoxicology to examine the impacts of environmental exposures on visual development and function.



**Natalie D.  
Hernandez,  
Ph.D., M.P.H.**

Dr. Natalie Hernandez's research interests are sexual and reproductive health disparities among ethnoracial minority women, social determinants of health, and health policy. Dr. Hernandez is also a former Satcher Health Policy Leadership Fellow. Prior to her doctoral studies, Dr. Hernandez conducted Community-Based Participatory Research and held leadership positions in a number of coalitions dedicated to advancing health equity. In addition to supporting community health promotion, education, and advocacy; she also provided technical assistance to support the provision of high quality culturally relevant, sensitive, and linguistically appropriate health care and prevention services.

Dr. Hernandez's expertise includes the health status and health needs of Latinos, promotores de salud (community lay health educators), HPV and cervical cancer among Latinas and other ethnoracial minorities, family planning, and health advocacy. She has published and presented her work at various international, national, state, and local conferences and published in peer-review journals. Dr. Hernandez is a guest editor for a special issue of the journal BioMed Research International. This issue will focus on the epidemiology of adverse birth outcomes particularly on emerging genetic/epigenetic, biomedical and statistical methodologies.



**Jessica Sprag-  
gins, M.P.H.,  
CCPH**

For the past 7 years, Jessica Spraggins has been a Health Education Specialist on the Health Communications Team in CDC's Division for Heart Disease and Stroke Prevention (DHDSP). Prior to her work in DHDSP, Jessica worked in the same capacity in the Health Communications Branch of CDC's Office on Smoking and Health for 6 years. Prior to her work in chronic disease prevention at CDC, Ms. Spraggins worked with the American Cancer Society, the Yale Center for Children with Special Health Care Needs, and ran her own daycare center. Ms. Spraggins is a graduate of The George Washington University where she received her BA in Health Science and Yale University, where she received her Master's in Public Health.

Aside from her work in public health, Ms. Spraggins has spoken previously as a survivor of childhood abuse and trauma. Her participation in this panel is from a personal perspective and incorporates how she used public health knowledge as part of her healing.





**Lucy Hall-Gainer,  
B.S., NCAC,  
CASAC**

Lucy Hall is the Founder and CEO of Mary Hall Freedom House. As the youngest of seven siblings, Lucy came from a family that battled generational addiction. Her mother died of alcoholism when she was six, and left behind seven children, some of whom later lost their lives to substance abuse. The impression her mother left in her life inspired Lucy to reach out to women who suffer from addiction and women with children. She desired to help bridge the gap from troubled lives and help women become independent and self-sufficient.

Today, her dream has become a reality with Mary Hall Freedom House (MHFH), named in memory of her mother. Through a community of sisterhood, Lucy coaches women to free themselves from the past and live every day for the future. Over 10,000 women and children have achieved recovery through Mary Hall Freedom House since founded in 1996; by empowering them to end the cycle of generational addiction, poverty and homelessness. *"Everyone here knows that God is really the head of this agency," Lucy states. "He has made it possible for us to minister to the women, children, and families sent through our doors."*

A native New Yorker, Lucy graduated from Shorter University with a degree in Human Services and holds national credentials as a substance abuse counselor. Lucy is the recipient of many awards that include: the 2002 Robert Wood Johnson Community Health Leader Award, the 2003 Mary Magdalene Award, 2003 Atlanta Magazine "Women Making a Mark" Award, the 2006 Turner Broadcasting Systems Pathfinder Award, the 2008 Leadership Sandy Springs Award, the 2010 All-State Statue to Greatness Award, the 2011 City of Sandy Springs MLK Award, the 2013 Restorative Justice Center "Community Warrior Award," the 2014 Turknett Leadership Character Award, and the 2016 Heart of Giving Award from Alpha Kappa Alpha Sorority, Inc. In all, Lucy enjoys her family, faith, and fitness. She is the proud mother of two children, Mary and Christian who are all faithful members of Elizabeth Baptist Church.





**Melvin Joel  
Konner, M.D.,  
Ph.D.**

Dr. Melvin Joel Konner is the Samuel Candler Dobbs Professor of Anthropology and of Neuroscience and Behavioral Biology at Emory University. He studied at Brooklyn College, CUNY (1966), where he met Marjorie Shostak; they married and had three children. He earned his PhD in biological anthropology from Harvard University in 1973. He spent two years doing fieldwork among the Kalahari San or Bushmen, studying infant development and the hormonal mechanism of lactational infertility. After six years on the Harvard faculty, he attended Harvard Medical School (MD, 1985), then moved to Emory as department chair.

From 1985 on, he helped develop the concept of a Paleolithic diet and its impact on health, publishing along with S. Boyd Eaton. He is the sole author of eleven books, including *The Tangled Wing: Biological Constraints on the Human Spirit* (Holt, 2002), *The Evolution of Childhood: Relationships, Emotion, Mind* (Harvard, 2010), and most recently *Women After All: Sex, Evolution, and the End of Male Supremacy* (Norton, 2015).

He has held grants from the National Institute of Mental Health and National Science Foundation, and has been a fellow of the American Association for the Advancement of Science, the Center for Advanced Study in the Behavioral Sciences, the John Simon Guggenheim Memorial Foundation, and the Foundations Fund for Research in Psychiatry. He was elected to the American Academy of Arts and Sciences in 2016.

His parents were deaf from their own childhood. Two decades ago he lost Marjorie to cancer after an eight-year struggle, beginning when their children were ages 9, 6, and 15 months. He is now happily remarried to developmental psychologist Ann Cale Kruger (College of Education, GSU; Project PREVENT; Break the Cycle mentor) and the grandfather of two.



## Conference Participants

### Emory University Department of Anthropology

#### Student Tatenda Mangurenje

**Tatenda Mangurenje** is a second-year Cultural Anthropology PhD student. Her research focuses on medical anthropology; particularly on the ways that the criminal justice system and family practices intersect through issues of health, violence and equality in the United States. Her chief interest lies in understanding the effects of maternal incarceration on child development.

#### Faculty Mentor Peter Brown, PhD

**Dr. Peter Brown** is a medical anthropologist who holds a joint faculty appointment as professor in Anthropology at Emory College as well as in the Department of Global Health at the Rollins School of Public Health at Emory University. As the founder of the successful interdisciplinary undergraduate program, Global Health at Emory, he has been very interested in the pedagogical challenges and opportunities of teaching "Foundations of Global Health." Along with colleague Svea Closser, he is currently completing an interdisciplinary textbook/reader for similar undergraduate courses to be published by Oxford University Press. He served as editor-in-chief of the journal *Medical Anthropology* for a decade and has won several national teaching and mentoring awards. His research interests have been in culture and disease ecology, with particular interest in malaria and obesity. He has co-edited: *Applying Anthropology*; *Applying Cultural Anthropology*; *The Anthropology of Infectious Diseases: Emerging Illnesses and Society*, and three editions of *Understanding and Applying Medical Anthropology*. He serves as senior academic advisor to the Emory Global Health Institute and has served on a malaria-related Scientific Advisory Committee for the World Health Organization

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### East Tennessee State University Department of Pediatrics

#### Student Pratibha Agarwal, MD

**Dr. Pratibha Agarwal** is currently completing her residency in pediatrics at East Tennessee State University. She is interested in pursuing fellowship in NICU after her residency. She has earned her

Master's in Public Health (MPH) degree with a concentration in Epidemiology from University of Texas Health Science Center, Houston. During her MPH, she participated in various research projects including clinical trials at MD Anderson Cancer Center. She has presented at the Texas HIV/STD Conference and the Society of Critical Care Medicine Conference.

### **Faculty Mentor**

**David Wood, MD, MPH, FAAP**

**Dr. David Wood** graduated with honors from Harvard University, then completed medical school and pediatric and preventive medicine residencies at UCLA. He also completed a fellowship in Health Services Research at RAND/UCLA. He is currently a Tenured Professor and Chair, Department of Pediatrics at the East Tennessee State University. For more than twenty years his research and advocacy efforts have focused on improving the health of and health care for underserved children and adults. He has published more than 150 peer-reviewed publications, reports, and book chapters. He has founded programs for and conducted advocacy-oriented research on multiple groups of disadvantaged children, including poor children, children in homeless shelters, children in foster care and youth with special health care needs. He directed the Jacksonville Health and Transition Services (JaxHATS) program from 2005 until late 2014, a model patient-centered medical home to over 1000 medically complex and developmentally disabled youth and young adults. Dr. Wood helped create and was the Medical Director of FloridaHATS, the Florida Office of Health Care Transition. Dr. Wood has been active in advocacy for disadvantaged children and adults, with a focus on children and adults with Intellectual and Developmental Disabilities, serving as a gubernatorial appointee to the Florida Developmental Disabilities Council for over 12 years. In his current position Dr. Wood is working with ETSU colleagues and community partners to evaluate the health and health care services of children and families in Middle Appalachia, and to build health care programs to meet children's critical health needs.

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## **Columbia University**

### **Mailman School of Public Health**

#### **Department of Environmental Health Sciences**

### **Student**

**Abigail Gaylord**

**Abigail Gaylord** is a second-year Master of Public Health student in the Environmental Health Sciences Department at Columbia University. She is pursuing a certificate in the Molecular Epidemiology track and is interested in the interactions between environmental toxins and social disparities and how these interactions affect children's health and development. Currently she is involved with research projects at the Columbia Center for Children's Environmental Health and at the Laboratory of Precision Environmental Biosciences at Columbia

**Faculty Mentor**  
**Julie Herbstman, PhD**

**Dr. Julie Herbstman** is an Associate Professor in the Department of Environmental Health Sciences at the Columbia Mailman School of Public Health. She is also the Co-Director of the certificate program in Molecular Epidemiology. She is an environmental and molecular epidemiologist whose research area focuses on the effects of prenatal and childhood exposures to environmental pollutants and the molecular mechanisms underlying these associations. She has been an investigator at the Columbia Center for Children's Environmental Health (CCCEH) for the past 10 years and directs a number of longitudinal birth cohort studies in NYC. She has expertise in the design, conduct and analysis of epidemiologic studies that include biomarker data.

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**University of Chicago**  
**Department of Pediatrics**

**Student**  
**Lea Redd**

**Lea Redd** received her undergraduate degree from the University of Chicago with a major in African and African American Studies. She joined the William Meadow Neonatal Epidemiology laboratory in 2012 as a clinical research coordinator. She distinguished herself in many realms, assisting a myriad of medical students and fellows to develop projects focusing on prognosis in the NICU and MICU. In 2015, she joined the Silver Linings for NICU Graduates project, researching the mechanisms that make medical-legal partnerships most effective for parents. She hopes to use her research experience in a Master's of Public Health in the future.

**Faculty Mentor**  
**Bree Andrews, MD**

**Dr. Bree Andrews** is a neonatologist whose expertise is the vulnerable period after discharge until school age for medically complex children at the University of Chicago. She sees the majority of medically high-risk infants discharged from the Comer Hospital NICU. Currently, Dr. Andrews is exploring two main areas for research. The first, the focus of Break the Cycle, is on how medical legal partnerships improve access to public benefits for NICU graduates. The second is evaluating the microbiome as a potential mediator of neurodevelopment. She receives research support from the NIH and through private funding. She serves as a member of the pediatric residency core faculty and the associate director of the neonatal-perinatal fellowship. She particularly enjoys teaching trainees from all levels.

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## University of Zambia, School of Public Health

### Department of Environmental Health

#### Student

**Nosiku Munyinda, MD**

**Dr. Nosiku Munyinda** is a lecturer and researcher and is responsible for the Environmental Pollution and Toxicology Unit in the Department of Environmental Health- at the School of Public Health at the University of Zambia. She has a broad background in environmental science and environmental management with specific training and expertise in natural resources management and environmental engineering. She is in the last year of her PhD program looking at "Recent Exposure to DDT and Neurodevelopmental Outcomes in Children of selected communities in Zambia". Her research interests lie in the interactions of chemical exposure in different settings with human health and generally the impact of economic development and its resulting pollution on the health of the Zambian population. In addition, Mrs. Munyinda has extensive experience in training and capacity building of an assortment of stakeholders in knowledge and skills related to Sound Management of general waste, healthcare and all other types of hazardous waste, Environmental Impact Assessment, Strategic and Health Impact Assessments, Trade and Environment, Cleaner Production. She has undergone training and undertaken review of Environmental Impact Statements (EIS'), Auditing and Strategic Environmental Assessment of various projects both in Zambia and Capetown in South Africa. She is also proficient and has trained different groups in monitoring of various environmental media such as food, water, air, soil and the human environment. She has special interest in children and their mothers as a sub-population. Nosiku Munyinda is PI and CO-PI for the World Bank Project in Kabwe on Health Interventions on lead exposed children and JICA Supported Chemical Visualization and Chronic Chemical Hazard Project respectively.

#### Faculty Mentor

**Charles Michelo, BSc, MBChB, MPH, MBA**

**Dr. Charles Michelo** is Professor of Epidemiology and Chair of the School of Public Health, University of Zambia where he also heads the Grants and Research Management Centre. His research interests are quite broad, including (but not limited to), infectious disease epidemiology (with focus on HIV), surveillance and health systems, maternal and child health, health impacts of climate change, chemical and heavy metal contamination, bacterial and viral contaminants in the environment, and One Health initiatives (which examine the holistic interactions of human, animal, plant, and environment) as well as Neglected Tropical Diseases. His critical role has been in mentoring young professionals and students through the conduct of research as well as getting involved in implementation research utilizing recent key findings. He has grown the Department of Public Health into a School of Public Health that will be a

leader in public science, training, research and practice. He has been instrumental in capacity building efforts with focus on core competencies in public health and associated disciplines especially at the School of Medicine at UNZA. Some of his projects include CDC PEPFAR supported cooperative agreements for the Master in Public Health strengthening program that has been a turn-around in re-adjusting public health and medical training; the EU funded REACT (Response to Accountable priority setting for Trust in health systems) as country PI; the PLACE study entitled "Searching for effective HIV interventions in sub-Saharan Africa: focusing on local contexts" funded by the Research Council of Norway; the Health for Poorest Population (HPP) mixed methods surveillance work focusing on maternal and neonatal health (UNICEF) as well as the Ethnographic work in the Saving Mothers and Giving Life consortium work. He is thus grounded in exposure medicine and grounded in ecological analyses that link exposure to effects that includes morbid states as well as mortality.

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## University of North Carolina at Chapel Hill Gillings School of Global Public Health

### Student Frank Stillo

**Frank J. Stillo III**, MSPH, is a Ph.D. candidate at the University of North Carolina at Chapel Hill, Gillings School of Global Public Health in the Environmental Sciences and Engineering Department. Frank has published his previous work titled, *Exposure to Contaminated Drinking Water and Health Disparities in North Carolina*, in the American Journal of Public Health in January 2017. Frank also currently works for the Environment, Health and Safety Department of the University as a Compliance Specialist for Resource Conservation and Recovery Act compliance in research labs and construction projects.

### Faculty Mentor Jacqueline MacDonald Gibson, PhD

**Dr. Jacqueline MacDonald Gibson** is an Associate Professor in the Department of Environmental Sciences and Engineering at the Gillings School of Global Public Health, University of North Carolina, Chapel Hill. She has a multi-disciplinary background in mathematics, engineering, and science that she has applied to study risk assessment, policy, and communication for more than 25 years. Much of her research centers on predicting population health impacts of alternative environmental policy decisions. For example, her recent research to quantify the health impacts of disparities in access to municipal water service in peri-urban areas of North Carolina arose from a request from the North Carolina Director of Public Health for estimates of the magnitude of risks facing such communities. Prior policy-relevant research includes a study to quantify the burden of disease from pollutants in air (indoor and outdoor), water, soil, and food in the United Arab Emirates (UAE)

in order to inform policy decisions by the Environment Agency—Abu Dhabi. Several policy recommendations from her UAE research (including expanding air and water quality monitoring networks and establishing an occupational health and safety administration) were implemented. Dr. MacDonald Gibson also led multiple studies to inform environmental policies in the US Environmental Protection Agency, Department of Defense, and other federal agencies while on the staff of the RAND Corporation and, before that, the US National Research Council. She has received multiple awards for her science policy work, including two best paper awards from *Risk Analysis*, the National Research Council Award for Distinguished Service (conferred to two staff members per year), and the RAND Merit Bonus Award (for one of the year's best science policy projects). She holds a dual PhD degree from the Department of Engineering and Public Policy and the Department of Civil and Environmental Engineering at Carnegie Mellon University. Her PhD studies were supported by a National Science Foundation Graduate Research Fellowship. In addition, she holds an MS in environmental science in civil engineering from the University of Illinois at Urbana-Champaign and a BA in mathematics (*magna cum laude*) from Bryn Mawr College.

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## Emory University, Rollins School of Public Health

### Department of Environmental Health

#### Students

**Catherine Evans, Patrick Fueta, Amrita Mahtani, Sam Peters**

**Catherine Evans** is an MPH candidate with a focus on Global Environmental Health. Her work focuses on the intersection of chronic disease and toxic exposures. Many of her projects integrate biomarker based exposure assessments, mobile data collection techniques, and community-based participatory research.

**Patrick Fueta** is a MPH candidate with a focus on Environmental Health. He has previously worked as a practicing physician in Nigeria, and developed an interest in Environmental Health because of an interest in exposure to indoor air pollution from burning fossil fuels and developing pregnancy related hypertensive states, with a primary interest in preeclampsia. Prospectively, he hopes to be able to apply the skill set gained in his MPH studies to a career in Obstetrics and Gynecology.

**Amrita Mahtani** is a MPH candidate with a focus on Global Environmental Health. She worked as a Product Development Engineer in the private sector designing and testing point-of-use water filtration devices for international markets. She hopes to continue a career in Water, Sanitation and Hygiene with an international NGO.

**Sam Peters** is an Environmental Health PhD student. His research focuses on how agricultural practices can impact the environment and health through trace gas emissions and soil



contamination. He strives to include community based and translational components in that research.

### **Faculty Mentor**

**W. Michael Caudle, PhD**

**Dr. Mike Caudle** is an Assistant Professor in the Environmental Health Department and holds an additional appointment in the Center for Neurodegenerative Disease at Emory University. His work is focused on examining the effect of exposure to environmental toxicants on the development and function of the nervous system, providing insight into the etiopathogenesis of neurological disorders. Dr. Caudle's research has identified the neuronal synapse as a particularly vulnerable target to toxicant-induced disruption during critical periods of neurodevelopment, especially in the context of *in utero* exposure to pesticides and flame retardant compounds. As these compounds have been linked with a variety of neurodegenerative and neurodevelopmental disorders, including Parkinson disease, Attention Deficit-Hyperactivity Disorder, and Autism Spectrum Disorder, understanding the cellular and molecular targets is imperative to developing effective environmental, educational, and pharmaceutical interventions.

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## **Lenoir-Rhyne University, Center for Graduate Studies**

### **Department of Public Health**

### **Student**

**Colleen Clark**

**Colleen Clark** is currently completing her MPH with a concentration in Community Health at Lenoir-Rhyne University Center of Graduate Studies in Asheville, NC. From an early age as a Junior Volunteer at Duke Hospital, her passion has been healthcare and service to others. Colleen obtained her Bachelor's in English and Sociology from Smith College. Her research interests at Smith were medical sociology and narrative medicine. After Smith, she had the opportunity to work at the Community Health and Wellness Center at Moses Cone Hospital. Here she was part of a team that worked to help indigent and medically underserved connect with resources. Since moving to Asheville she has had the opportunity to work at the North Carolina Institute for Climate Studies as a research assistant, and as a graduate assistant at Lenoir-Rhyne. Her research interests are the intersections of health with language, technology and the environment.

**Faculty Mentor**  
**Kimberly Price, PhD, MCHES**

**Dr. Kimberly Price** is an Assistant Professor of Public Health at Lenoir-Rhyne University and a Master Certified Health Education Specialist with over 15 years of experience in health promotion and community health. Dr. Price has devoted her career to reducing disparities in health for disadvantaged and vulnerable populations. She earned her master's degree from Columbia University and her doctorate from the University of Cincinnati, where her research focused on understanding how social and spiritual connections influence health behaviors. Her current scholarly interests include child and maternal health, injury prevention, and immunization acceptability, and she serves on the board of MountainTrue, a conservation and environmental organization.

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**Tuskegee University, College of Veterinary Medicine**  
**Department of Nursing and Allied Health**

**Student**  
**Hope Bentley**

**Hope Bentley** is a graduate student at Tuskegee University in Tuskegee, Alabama. She was born in Tuskegee, AL and raised in Auburn, AL. She completed her elementary and secondary education in Auburn public school systems. She is currently in her last year of the Occupational Therapy Master's program at the university. She is a member of the following honor societies: Pi Theta Epsilon (Occupational Therapy), Epsilon Tau Sigma (Allied Health), Sigma Alpha Pi, Golden Key International, and the National Center for Bioethics in Research and Health Care honors program. She is a lifelong Albert Schweitzer fellow. She also serves as the community chair of the Tuskegee University Student Occupational Therapy Association club (SOTA); and volunteers to work with various after school and outreach programs with elementary and high school students in Macon County, AL.

**Mentor**  
**Jannett Lewis-Clark, MOT, OTD, OTR/L, CLT**

**Dr. Jannett Lewis-Clark** has been an occupational therapist for 26 years. She is currently the Department Head of Allied Health, Interim Occupational Therapy Program Director, and Assistant Professor teaching in the Occupational Therapy Department at Tuskegee University. Dr. Lewis-Clark has also served as Clinical Instructor for Tuskegee University and University of Alabama at Birmingham with areas of expertise in pediatrics, adult and geriatric rehabilitation. Dr. Lewis-Clark received her Doctorate of Occupational Therapy degree from Rocky Mountain University in Provo, Utah, a Master of Occupational Therapy degree from Texas Woman's

University in Houston, Texas and a Bachelor of Arts degree from The University of Alabama in Tuscaloosa, Alabama. Dr. Lewis-Clark has received certifications in work compensation/work hardening, assistive technology and lymphedema therapy. Dr. Lewis-Clark is currently a board member for JECCO Health Advisors in Birmingham, Alabama.

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## **Icahn School of Medicine at Mt. Sinai**

### **Department of Public Health**

#### **Student**

##### **Luis Torres**

**Luis Torres** is currently pursuing a Master's in Public Health from the Icahn School of Medicine at Mount Sinai in New York City, focusing on epidemiology and environmental health. His interests lie in population health research and the development of evidence-based health policy, particularly with how facets of our everyday environment interact with personal, genetic and behavioral factors to shape our overall health and well-being. He also holds a Bachelors in Biological Sciences from Virginia Tech.

#### **Mentor**

##### **Cappy Collins, MD, MPH**

**Dr. Cappy Collins** has a background in digital media design, followed by medical training at the Mount Sinai School of Medicine, pediatrics residency at the University of Rochester, and a fellowship in children's environmental health at Mount Sinai. His professional interests in child advocacy and community health led to the creation of Cyclopedia ([cyclopedia.us](http://cyclopedia.us)), a bicycle program that combines physical activity with collaborative online documentation to empower urban adolescents and reduce chronic stress; and Cada Paso ([cadapaso.us](http://cadapaso.us)), a family-based walking program to promote physical activity, social networking and health resource utilization. He is also co-founder of the New York State Pediatric Advocacy Coalition (NYSPAC) dedicated to promoting child health advocacy training, supporting successful child advocacy programs, and providing a statewide legislative voice. He is currently Assistant Director of the New York State Center of Excellence in Children's Environmental Health at Stony Brook. Dr. Collins is a proud alumnus of Break the Cycle 7 and 8.

# Southeast Pediatric Environmental Health Specialty Unit Team at Emory University

## Emory University School of Medicine Department of Pediatrics

PEHSU

### **Robert J. Geller, MD**

**Robert Geller** currently serves as the Chief of the Emory Pediatrics Service at the Grady Health System/CHOA, Hughes Spalding campus, as Medical Director of the Georgia Poison Center, and as Director of the Emory Southeast Pediatric Environmental Health Specialty Unit (PEHSU). Dr. Geller graduated in 1979 from Boston University School of Medicine. He then pursued his residency and Chief Residency in Pediatrics at the Medical College of Virginia in Richmond, followed by a fellowship in Clinical Pharmacology and Toxicology at the University of Virginia in Charlottesville. He is a fellow of the American Academy of Pediatrics, the American College of Medical Toxicology, and the American Academy of Clinical Toxicology and a Diplomate in Clinical Informatics of the American Board of Public Health. He has been a member of the Southeast PEHSU since its formation in 2001. He is the author of more than 50 publications, and is one of the editors of the text, *Safe and Healthy School Environments*. He is the author or co-author of numerous community information sheets and has met with community members at many sites of children's environmental health concern throughout the Southeastern United States.

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## Emory University Nell Hodgson Woodruff School of Nursing

PEHSU

### **Abby D. Mutic, RN, CNM**

**Abby Mutic** is a Certified Nurse Midwife and a current doctoral candidate in the Nell Hodgson Woodruff School of Nursing at Emory University. She blends clinical expertise with occupational and environmental research dedicated to serving communities with large health disparities. Abby studies environmental toxicants that disrupt normal gut bacteria and negatively influence maternal and fetal health. She also participates in nursing and public health education through the Emory School of Nursing. Abby has many years of experience working in clinical settings with women and children and is currently serving the Atlanta metro area through her work at Grady Health System. In addition to her membership on the Southeast PEHSU, Abby co-directs the Community Outreach and Translation Core for the Emory University's Center for Children's Health, the Environment, the Microbiome and Metabolomics.

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## Morehouse School of Medicine

### Department of Pediatrics

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#### Leslie Rubin, MD

**Leslie Rubin, MD**, is Associate Professor in the Department of Pediatrics at Morehouse School of Medicine and Co-Director of the Southeast Pediatric Environmental Health Specialty Unit at Emory University. He founded the Institute for the Study of Disadvantage and Disability (now renamed Innovative Solutions for Disadvantage and Disability) in May 2004 and launched the first Break the Cycle Program in 2004-2005! He is dedicated to improving awareness and understanding of the relationship between social and economic disadvantage and disabilities in children. Since 2000, he has been a Co-Director with the Southeast Pediatric Environmental Health Specialty Unit at Emory University, where he focuses on raising awareness of environmental health disparities and promoting health equity for children - particularly those who are most vulnerable from exposure to adverse environmental factors. In 2012, the American Academy of Pediatrics (AAP) presented Dr. Rubin with the Calvin C. J. Sia Community Pediatrics Medical Home Leadership and Advocacy Award, honoring pediatricians who have advanced the medical home through practice and advocacy, especially for children with special health care needs. On behalf of ISDD, he received the 21st Annual Community Service Award from Emory University Rollins School of Public Health and The Goizueta Business School of Emory University.

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## Emory University School of Medicine

### Department of Obstetrics & Gynecology

PEHSU

#### Kurt Martinuzzi, MD

**Kurt Martinuzzi, MD**, is an Assistant Professor in Obstetrics and Gynecology at Emory University. His interests include resident and medical student education, recurrent pregnancy loss, premature ovarian failure and polycystic ovary syndrome. Over his 20 plus year career he has been awarded multiple teaching awards and presented at many national and regional Ob/Gyn meetings. His current NIH funded research involves the evaluation of a new rapid PCR technique to identify the shedding of HSV virus in laboring women.

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## Emory University

### Department of Psychiatry and Behavioral Sciences

PEHSU

**Claire Coles, Ph.D.**

**Claire D. Coles, Ph.D.**, is Professor of Psychiatry and Behavioral Sciences and Pediatrics at Emory University School of Medicine, and Director of the Center for Maternal Substance Abuse and Child Development (MSACD) at Emory. Dr. Coles' research on the developmental and behavioral effects of prenatal exposure to drugs and alcohol and on the interaction of these effects with the postnatal environment began in 1980 and was among the first to describe many behavioral effects of prenatal exposure in infants, young children and adolescents as well as the effects on brain in young adults. She was also among the first to investigate effects of cocaine exposure on child development. In 1995, Dr. Coles established the only multidisciplinary clinic in the Southeastern United States providing specialized services to individuals prenatally exposed to drugs and alcohol. Currently the Emory Neurobehavior and Exposure Clinic (ENEC) serves more than 200 new patients a year, providing differential diagnosis and behavior evaluation, referral, psychotherapy and educational services. In the addition to training of professionals in the care of children with prenatal exposure as well as environmental stress, MSACD carries out Clinical Research to design and improve interventions for affected individuals and their families, including the MILE (Math Interactive Learning Experience) program and the GoFAR intervention that supports self –regulation and adaptive functioning for children 3 to 9 years. Dr. Coles work has received national and international attention through the publication of numerous articles and books on these topics.

Dr. Coles is the Director of MothertoBaby.Georgia, a Teratology Information Service associated with the National Organization of Teratology Information Specialists that provides free counseling to pregnant and breastfeeding women, their families and the professionals who care for them about the implications of exposure to drugs, alcohol, prescription medications and environmental exposures.

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## Innovative Solutions for Disadvantage and Disability

PEHSU

**Laura Wells, LCSW**

**Laura Wells** serves as Project Administrator for the Southeast Pediatric Environmental Health Specialty Unit. She is Program Director for ISDD, Innovative Solutions for Disadvantage and Disability. Ms. Wells directs Project GRANDD, a program providing intensive supports to

grandparents who are raising grandchildren with disabilities. She serves as the Program Director for Healthcare Without Walls: A Medical Home for Homeless Children (HWW) and Healthcare Without Walls-Veterans (HWW-V). As Project Administrator for the PEHSU, Ms. Wells serves as the initial contact to the SE PEHSU as well as the project coordinator to our Break the Cycle projects. Ms. Wells is a Licensed Clinical Social Worker with almost 20 years of experience working with children and adults with developmental disabilities. She is also the parent of a child with special needs. With this diversity, she shares insight with parents and professionals alike.

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## **George Washington University Children's National Medical Center in Washington D.C.**

Break the Cycle Consultant  
**Benjamin Gitterman, MD**

**Benjamin Gitterman, MD** is Associate Clinical Professor of Pediatrics and Public Health at George Washington University and Children's National Medical Center in Washington D.C. His major interests have included Children's Environmental Health, Child Advocacy, and Community Health-focused training and program development. Prior to coming to Washington D.C., he was the Director of Ambulatory Pediatric Services for Denver Health and Hospitals, and was a faculty member of the University of Colorado School of Medicine. In Washington, he has been the Chair of General and Community Pediatrics at Children's National Medical Center. Dr. Gitterman was a co-founding Director of the Mid-Atlantic Center for Children's Health and the Environment (the PEHSU serving the mid-Atlantic region). He is a member of the Children's Environmental Health and Protection Advisory Council for the State of Maryland. He has been a member of the Scientific Advisory Board for Children's Environmental Health of the U.S. Environmental Protection Agency, and has been a liaison member to the Advisory Committee for Children's Lead Poisoning and Prevention for the CDC. He has been a member of the American Academy of Pediatrics (AAP) Committee on Children's Environmental Health. He is currently the Chairperson of the AAP Council on Community Pediatrics and is a member of the AAP Task Force on Childhood Poverty. He continues to be a practicing pediatrician.



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## **Health Services, Division for Intellectual and Developmental Disabilities, Ministry of Social Affairs and Social Services, Jerusalem**

Break the Cycle Consultant/Editor-in-Chief

**Joav Merrick, MD, MMedSci, DMSc**

**Joav Merrick, MD, MMedSci, DMSc**, is Professor of Pediatrics, Child Health and Human Development, Kentucky Children's Hospital, University of Kentucky, Lexington, United States and affiliated with the Division of Pediatrics, Hadassah Hebrew University Medical Center, Mt Scopus Campus, Jerusalem, Israel. He is the Medical Director of the Health Services Division for Intellectual and Developmental Disabilities, Ministry of Social Affairs and Social Services, Jerusalem, and the founder and director of the National Institute of Child Health and Human Development in Israel. He has authored numerous publications in the fields of pediatrics, child health and human development, rehabilitation, intellectual disability, disability, health, welfare, abuse, advocacy, quality of life and prevention. Dr Merrick received the Peter Sabroe Child Award for outstanding work on behalf of Danish Children in 1985 and the International LEGO-Prize ("The Children's Nobel Prize") for an extraordinary contribution towards improvement in child welfare and well-being in 1987.

**Thank you to our sponsors and participants.**

**Southeast Pediatric Environmental Health Specialty Unit at Emory:**

**[www.pehsu.emory.edu](http://www.pehsu.emory.edu)**

**Innovative Solutions for Disadvantage and Disability: [www.isdd-home.org](http://www.isdd-home.org)**

**Sustainability Initiatives at Emory University: [www.sustainability.emory.edu](http://www.sustainability.emory.edu)**

**Georgia Council on Developmental Disabilities: [www.gcdd.org](http://www.gcdd.org)**



## Overview of Break the Cycle

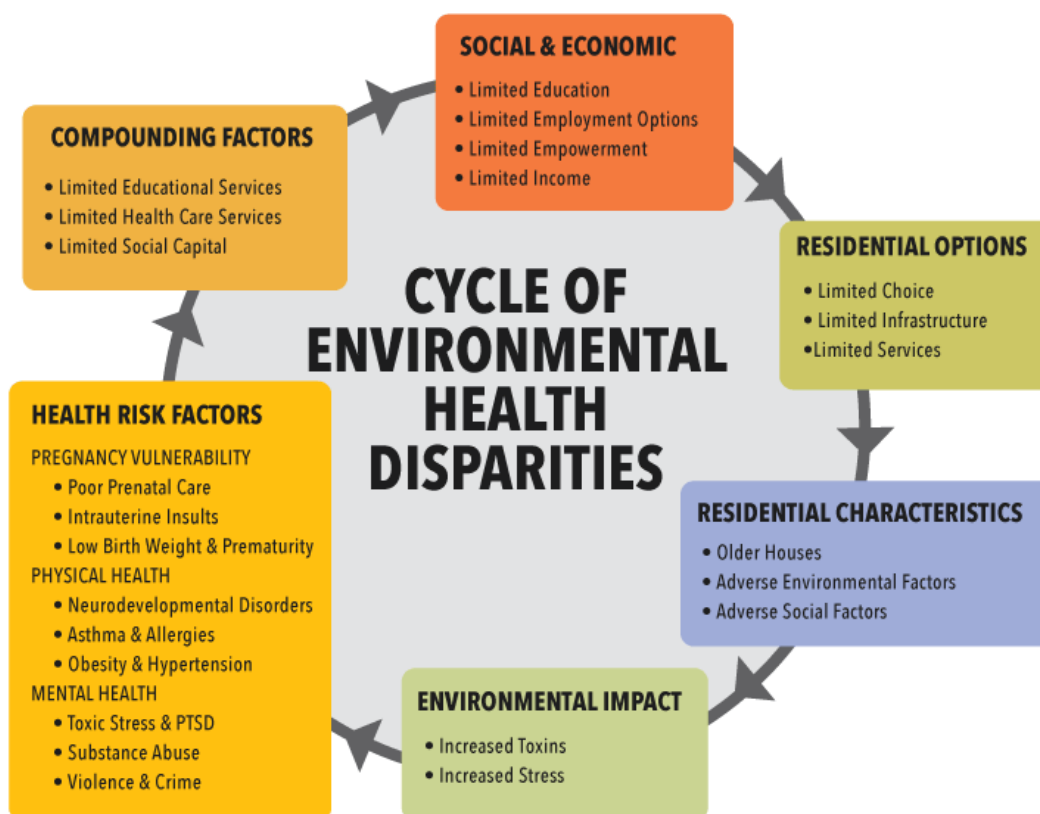
The threats to children's health and well-being are often multiple and complex. Children are uniquely vulnerable to environmental toxicants for several reasons: they are growing rapidly; they have a more active metabolic rate than adults; they breathe larger amounts of air for their size; they have a greater surface area-to-body mass; they are closer to the ground, and they may pick up and play with objects and then put these objects in their mouths and may even swallow them. They are at risk, therefore, to absorb more toxins in the environment through their skin, from the air they breathe, from the food they eat, and the water they drink. Also, they do not yet have the fully sophisticated metabolic systems to detoxify some chemicals, or they may metabolize chemicals into toxic metabolites at a different rate than adults. Furthermore, because they are growing rapidly and their organs and organ systems are developing, they may incorporate toxins into their developing organ systems which can have immediate adverse impact. They are more likely to suffer long-term consequences on organ structure and function that may only be evident much later in life.

Today, some of the major health concerns for children, such as asthma, obesity and its complications of hypertension and diabetes, and neurodevelopmental disorders (most commonly learning disabilities, attention deficit hyperactivity disorder and autism), are often caused or exacerbated by environmental factors. Not only does the presence of a disorder or disability create significant complications that affect the child's health as well as learning and social opportunities, but it may adversely the child's potential for self-actualization and fulfillment. This is a challenge, not only at an individual level, but also at the level of the family and community and, ultimately, it also has an impact on society in terms of prevention and management strategies, and utilization of resources as well as how society cultivates its future citizens, workforce, and leaders.

Not only are children vulnerable to the chemical, physical and microbiological factors in their environment, they are uniquely sensitive to the social and economic environment in which they live, learn, and play. It has become increasingly evident that children who grow up in an environment of social and economic disadvantage are at greater risk for exposure to toxins like lead and other chemicals. They are impacted by the age and quality of the houses in which they live as well as the schools where they learn, the infrastructure of the communities in which they live, the risks of violence that they may experience, and the associated emotional stress that they face on a day to day basis. The vulnerability of these children is therefore magnified by their risks for exposure and by limitations in support for optimal education, access to quality

health care, infrastructure, and limited social capital. The sum of all these risks is great because all of these risks are cumulative.

The diagram below illustrates the elements that operate when children are born into circumstances of social and economic disadvantage and the resultant impact that manifests in disparities in health and education. The diagram also illustrates how the pattern becomes intergenerational and traps people in this cycle.



Our real challenge is how to Break the Cycle and liberate the children by providing a more nurturing and supportive environment, greater access to quality education and health services and to opportunities for success in life. We know this can be achieved at many different levels.

At a fundamental level, the idea of changing the life of one child for the better can have a positive impact not only for that child, but also for the family, for other people who know that child and for what that child can do in the present and in the future to change the world for the better. So, it might be said that “if you save the life of one child, you may be saving the

whole world!” Ideally, it would be desirable to improve the lives of as many children as possible today, so that we have a better world in the future. Realistically, however, doing so would require substantial changes, if not complete redesign to many of our social institutions, including the health care delivery system, educational system, social safety net systems and economic and financial systems. Because those changes are beyond our scope and require large shifts in politics and economics over long periods of time, we have developed an approach to *Break the Cycle* and change the world a little at a time towards achieving health and educational equity for our most vulnerable children.



## Resilience

Each year the Break the Cycle has a theme that helps shape the program. In past years, we have focused on Schools, Prenatal Factors, Community Gardens, Costs and Benefits of Breaking the Cycle, and last year on Community Engagement. For our 12<sup>th</sup> Break the Cycle Program 2016-2017 we have chosen Resilience as our theme. Resilience can be defined in many ways but basically refers to the process of adapting well in the face of adversity, trauma, tragedy, threats or significant stress. Resilience relies on effective responses to environmental challenges and ultimate resistance to the deleterious effects of stress towards assuring successful adaptation and optimal physical, emotional and social well-being.

Break the Cycle specifically focuses on the vulnerability of children who grow up in circumstances of social and economic disadvantage, and how exposure to adverse environmental factors have a negative impact on their health, growth and development, and what we can do to break this cycle to assure the children will have a positive future. Since the inception of Break the Cycle we have explored many different ways to understand the situation and make a positive difference. Threaded throughout has been the expectation that we can overcome adversity and move forward with the promise of a better future for the children and their families.

When we examine statistics, we may not fully appreciate that the data are aggregates. The 'facts' that emerge, are not absolute; rather, they represent a greater likelihood of outcomes without necessarily acknowledging the range of possibilities, within which is the reality that different children who are exposed to the same set of environmental experiences are likely to have quite different outcomes. The determinants of the outcomes are multiple and varied and include physiological, psychological, genetic and experiential factors. Although we cannot directly affect the genetics of an individual, we are able to affect the environmental factors which, in many (or most) cases, operate epigenetically, as well as the different social context in which they are expressed.

Some of the factors that promote resilience include a loving and supportive environment, positive relationships with adults and peers, and supportive, attentive and responsible parenting, as well as avoiding repeated exposure to stress and trauma, among many others.

In our symposium on day 2 of the Break the Cycle conference we will hear from three people who overcame adverse life experiences to become successful personally and professionally. We will also hear about the anthropology of resilience from renowned author and speaker, Professor Melvin Konner of Emory University. The symposium will include round table discussions by small groups of conference attendees to further explore the phenomenon of resilience and examine strategies to promote this important life preserving quality.



# Student Project **ABSTRACTS**

# Mothers in Prison: The Effects of Mass Incarceration on Children's Behavioral Health Outcomes

**Tatenda Mangurenje**, *student*; Dr. Peter Brown, *mentor*  
Emory University Cultural Anthropology  
Department of Anthropology

This study examines the role of maternal incarceration on child behavioral health outcomes across racial groups in Georgia.

## **Hypothesis:**

Children with incarcerated mothers will report higher rates of internalized and externalized behavior problems as compared to children separated from their mothers at birth.

**Background:** The number of incarcerated women in the United States has increased 131% since 1991. Approximately 70% of these women have children under the age of 18 and many of these women were their children's primary caregivers before their incarceration. As such, the children of incarcerated women are largely becoming the forgotten victims of this criminal justice system. This study aims to examine whether children between the ages of 3 and 8 who were separated from their mothers due to maternal incarceration report higher levels of mental health problems than those who were removed from their mothers at birth.

**Methodology:** Data for this study were drawn from the Emory Fetal Alcohol Syndrome Clinic. Data were collected from forty participants. First, the study used logistic regression models to examine mental health indicators. The dependent variables were modelled using demographic characteristics. Then, models were ran using length of time living with incarcerated parent, length of time separated from incarcerated parent and number of placements between last and most current placements. Thematic analyses of children's family histories were also conducted.

**Results:** Results indicated that children with incarcerated parents had higher rates of internalized behavior problems.

**Discussion:** The results demonstrate the need for effective intervention programs aimed at reducing the negative effects of separation.



# Factors Associated with Maternal Drug Use and the Severity of Neonatal Abstinence Syndrome

**Dr. Pratibha Agarwal**, student; Dr. David Wood, mentor;  
Beth Bailey, PhD, statistician; Jesi Hall, research assistant.  
East Tennessee State University  
Departments of Pediatrics and Family Medicine

The objective of this study was to describe our sample of women giving birth to infants who were drug exposed and experienced Neonatal Abstinence Syndrome and to determine the maternal and neonatal factors associated with the severity of Neonatal Abstinence Syndrome (NAS) as measured by the length of stay in the Neonatal Intensive Care Unit (NICU).

## Hypothesis:

- (1) The severity of NAS is determined by multiple infant health and maternal social, health and behavioral factors.
- (2) Polysubstance abuse by mothers may affect the severity of drug withdrawal in neonates

**Background:** East Tennessee and Middle Appalachia is the epicenter of the prescription drug epidemic, with approximately 15% of women giving birth at our institution documented as taking buprenorphine or methadone under medical assisted therapy for drug addiction or using other opioids, benzodiazepines or other drugs illicitly. NAS is a drug withdrawal syndrome that occurs when infants are born to women using illicit and prescription opioids and other drugs. The incidence of NAS in North East Tennessee in 2016 was over 50 per 1000 births. The management of drug withdrawal in neonates requires prolonged stays in NICU that can cause emotional and financial burdens on the family.

**Methodology:** We abstracted the records of 73 infants diagnosed with NAS and treated in our Neonatal Intensive Care Unit from 2013 to 2016. The information documented in the hospital record contained information from the prenatal and birth history, drug urine and cord tissue screening, and the infant's nursery and NICU stay. On the infants we recorded the infants' length of stay, gestational age, gender and birth weight (low birth weight); whether the infant received breast feeding, nonpharmacological and pharmacologic treatment for NAS and the infant's highest Finnegan score. On the mothers we recorded the mothers' age, parity and type of delivery; mothers' marital status (unmarried vs. married), educational level and insurance type (public vs private); maternal history of mental illness; maternal hepatitis C status; maternal tobacco use (> 5 cigarettes per day in last trimester); buprenorphine, methadone, benzodiazepine or other illicit drug use. We conducted bivariate analyses and multivariate modeling (least squares regression with backward elimination) of the above variables against the infant's length of stay (our proxy for severity).

**Results:** The infants' length of stay was 17.74 (s.d. = 11.6), **15% were low birthweight**, and had an average gestational age of 38.8 (s.d. = 1.8); 60% were male; 41% were breast fed; **52% received nonpharmacological** and **86% received pharmacologic (morphine) treatment for NAS**. The infants' highest Finnegan score was a mean of 18.1 (s.d. = 2.7). The mothers mean age was 28.3 (s.d. 4.8); mean parity was 1.74 (s.d. = .49); 34% delivered by C-section; 72% were unmarried; 34.2% had less than HS and 38.4% had HS education; 87% were on public health insurance; **53% had a history of mental illness**; 37% were positive for hepatitis C; **53% smoked more than 5 cigarettes per day in last trimester**; **90% were taking buprenorphine**, **9% were taking methadone**, **9% were had cord tissue positive results for benzodiazepine** and 71/73 had exposure at some time during pregnancy to other prescription or illicit opioids. Variables significant in the bivariate analysis at  $p = 0.15$  or less are in **bold** above. In the least squares regression with backward elimination the following variables significantly predicted the infant's length of stay (our proxy for severity): Preterm infants had 2.3 day longer LOS on average ( $p = 0.27$ ) compared to term infants; infants exposed to benzodiazepines had 12.7 day longer LOS on average ( $p = 0.07$ ) and infants born to mothers smoking  $> 5$  cigarettes per day in the last trimester had 6.4 day longer LOS on average ( $p = 0.022$ ).

**Discussion:** Maternal use of prescription or illicit opioids is rooted in women's' life histories characterized by disadvantage and/or abuse, as exemplified in our sample by relationship instability, low educational levels and poverty. They have other vulnerabilities such as mental illness, smoking, a past history of IV drug use and a current history of poly drug use in addition to medically assisted therapy for opioid abuse. All infants in our sample were exposed to both opioids and other drugs, however only benzodiazepines and cigarette smoking were associated with an increased LOS, our proxy for the severity of the NAS episode. Primary prevention efforts should target the root causes of maternal drug use including poverty, inadequate education and mental illness. Secondary prevention interventions to reduce the severity of NAS should be targeted at reducing smoking, opioid addiction and poly drug use prior to and during pregnancy.

# Impact of Early Life Housing Instability on Child Behavior at Age 7

**Abigail Gaylord**, *student*, Dr. Julie Herbstman, *mentor*  
Columbia Center for Children's Environmental Health  
Columbia University, Mailman School of Public Health

This study examines methods of defining housing instability and how housing instability acts as a predictor of child behavior outcomes.

## **Hypothesis:**

We hypothesize that children who are exposed to housing instability during early life are at greater risk of developing behavioral problems with clinical implications by age 7.

## **Background:**

Housing instability is a well-recognized problem for low-income populations, specifically for those living in urban environments. Housing instability differs from housing mobility in that families are forced to move due to financial limitations, rather than by choice. This instability may be useful as a marker for future behavioral problems.

## **Methodology:**

A regression model was used to assess the relationship between housing instability and behavior outcomes in a cohort of mothers and children drawn from the Columbia Center for Children's Environmental Health Sibling Study. Housing instability was determined by the number of address changes reported, material hardship, pest problems, building structure, and satisfaction with living conditions. Results from the Child Behavior Checklist (CBCL) assessed at age 7 were used to assess behavior outcomes.

## **Results:**

Material hardship, building disrepair, and pest problems were not significant predictors of maternal satisfaction with current living conditions. Increased number of address changes alone was not significantly associated with higher scores on the CBCL in any category. For children who experienced no moves and whose mothers reported dissatisfaction with their current living conditions there was a significant association with CBCL scores in the overall externalizing behaviors category. Children who experienced homelessness at any time before the age of 7 had significantly lower raw scores in the internalizing behaviors, externalizing behaviors, and total score categories on the CBCL.

## **Discussion:**

Defining housing instability involves not only number of moves but also maternal satisfaction with the current living conditions. Maternal feelings about housing conditions and homelessness may be better predictors of behavioral problems in childhood than number of address changes alone.

# Silver Linings for Infants Born Prematurely: Coordinated Legal Advocacy to Improve Access to Public Benefits within a Complex Care Clinic

Lea Redd, *student*, Dr. Bree Andrews, *mentor*

The University of Chicago Medical Center, Department of Pediatrics

**Background:** Approximately a half of a million infants are born premature in the United States each year. Although most are born late preterm and have some medical complexity, 40,000 require extended NICU care that changes their medical and developmental trajectory in early childhood. Most of the very low birth weight (VLBW) will require additional supports in the first five years of life. Accessing these supports can prove difficult even with medical advocacy.

**Objective:** To provide legal advocacy for children within a complex care clinic to improve family and child functioning as well as to secure developmental benefits for patients.

**Methods:** 100 infants who attended the Center for Healthy Families for NICU follow-up at the University of Chicago over a one year period were screened using a legal and developmental needs assessment in clinic. 35 were approached to participate in this study. Four methods of assessment were used in this intervention: 1. Pre- and post-evaluation of overall parental functioning called the Parenting Hassles Index (PHI) 2. Pre and post evaluation of child functioning called the WIDEA-FS 3. Introduction and follow up of a medical, legal, parenting 'action plan' to establish public benefits related to neurodevelopment. 4. An assessment of actual attainment of public benefits related to legal advocacy.

**Results:** 25 families enrolled in this study. The average birthweight and Gestational Age for these infants was 27.5+/- 1 weeks and 750gms +/- 90gms. The current age of participants is 47 months +/- 1 yr. 75% of infants had 3 or more neonatal morbidities such as bronchopulmonary dysplasia or retinopathy of prematurity upon NICU discharge. 53% have current medical complexity such as a feeding tube, tracheostomy, autism spectrum disorder or attention deficit disorder. Among those for whom we had pre and post PSI and WIDEA-FS scores, there was an overall adjusted improvement in both of approximately one standard deviation in parental and child functioning for age. On average, we documented that at least half of the action items on the 'action plan' were able to be completed. Three quarters of the families have been able to obtain additional public benefits such as Early Intervention or an appropriate IEP in school to support development. However, not all children are still able to attend school or receive full benefits because of the complex nature of their needs such as the availability of a full-time nursing care in school. Qualitatively, we gathered interview information from 5 families, who reported changes in empowerment and confidence in seeking developmental and educational supports for their children. Sadly, one patient died of complications after a bone marrow transplant and could not complete our study.

**Conclusions:** Legal advocacy and expertise changes the capacity for parents to engage in processes that are often complex related to the developmental needs for their children. Screening parents ahead of a legal crisis can allow for mapping of needs onto an 'action plan,' where all stakeholders can participate in building a pathway of access to appropriate services. This research can be used to modify our practice in complex care such that families can benefit from the processes we outlined, even when a legal advocate or a medical legal partnership is not available.

# Recent DDT Exposure and Neurodevelopmental outcomes in children of selected communities in Zambia

**Dr. Nosiku Munyinda**, *student*; Dr. Charles Michelo, *mentor*

University of Zambia, School of Public Health, Department of Environmental Health

## Background:

Malaria is a leading cause of morbidity and mortality in Zambia accounting for nearly 36% of all hospital admission mostly affecting pregnant women and children. The Government of Zambia has employed an Integrated Vector Management Strategy of which Indoor Residual House Spraying with chemicals in one such intervention. Dichlorodiphenyltrichloroethane (DDT) a Persistent Organic Pollutant is one of the chemicals used despite epidemiological evidence associating it with various adverse ecological and health effects around the world. The study aims to investigate the association between recent exposure to DDT and neurodevelopmental outcomes in children of selected communities in Zambia.

## Methods:

The Ages and Stages Questionnaire (ASQ) was used to conduct neurodevelopmental assessments on two cohorts of mother and child pairs that were selected from the study areas based on exposure status as established through a previously done Environmental Exposure Assessment. This assessment tool measures language, problem solving and emotional adjustment in children below the age of four years.

## Results:

Weak associations were found between recent exposure to DDT and performance in the ASQ. This was particularly seen in the domain of "fine motor" and problem solving. Children were found to score as low as 25 points which put them below the threshold scores. A number of children were also found to have hearing difficulties.

## Conclusions:

The use of DDT for malaria control in Zambia poses an ethical dilemma because in most cases, this highly dangerous chemical is only used in low cost housing structures inhabited by people who are also socio-economically disadvantaged. The children from these homes are already exposed to other health and developmental risks and usually born from parents with very poor educational levels.

# Racial Disparities in Access to Municipal Water Supplies in the American South: Impacts on Children's Health

**Frank Stillo**, *student*; Jackie MacDonald Gibson, *mentor*

The University of North Carolina at Chapel Hill, Gillings School of Global Public Health

**Background:** Throughout the former plantation crescent of the American South, African American neighborhoods on the fringes of cities and towns were systematically excluded from access to municipal services, including water and sewer service, paved roads, and police and fire protection. More than five decades after the Civil Rights Act, many such neighborhoods still lack municipal services, even as those services have been extended to newer, majority white neighborhoods. Yet, little is known about the health impacts of these exclusionary zoning practices.

**Hypotheses:** Peri-urban African American neighborhoods excluded from municipal water service in Wake County, North Carolina, face higher risks of exposure to microbial contaminants and lead in their drinking water than neighborhoods supplied by municipal systems. These disparities in exposure, in turn, increase the risks of acute gastrointestinal illness and cognitive impacts in children.

**Method:** Water samples will be collected and tested for fecal indicator bacteria, lead, and other metals in 30 households recruited from peri-urban, majority African American communities in Wake County relying on private wells for their drinking water. In addition, surveys will be administered to 1,000 affected households to determine the use of well water for drinking, the use of point-of-use or whole-house water treatment devices, the frequency of water quality testing, the frequency of well maintenance, and household demographics. Using the resulting water quality and survey data along with available public health and municipal water quality data, a quantitative risk assessment will be conducted to estimate the impacts of exclusion from municipal water service on children's health.

**Discussion:** The recent Flint, Michigan, water crisis has renewed attention to disparities in the quality of municipally supplied drinking water. However, very little attention has been paid to disparities in drinking water quality and health in communities that have been systematically excluded from nearby, high-performing municipal water supplies. In order to break the cycle of increased risks in these communities, financial and technical support may be needed to enable communities to either advocate for connections to the municipal water supply or to follow recommended well water testing, treatment, and maintenance procedures.

# Lead Education Deployment and Child Interactive Teaching

Catherine Evans, Patrick Fueta, Amrita Mahtani, Sam Peters, *students*; Dr. Michael Caudle, *mentor*

Emory University Rollins School of Public Health  
Department of Environmental Health

This project developed, piloted, and assessed a lead exposure awareness curriculum for a metro Atlanta Boys and Girls Club.

## **Project Aims:**

- (1) Create a curriculum for educators to teach children in the 3rd-5th grade about lead hazards and exposures.
- (2) Assess the effectiveness of this curriculum.

**Background:** Lead poisoning is a pressing environmental health issue, and most cases are due to exposure from paint in older housing. Children are most at risk for these exposures and the most vulnerable to subsequent health effects. Education on public health issues such as lead poisoning can lead to improved outcomes.

**Program Implementation:** This program was designed using the EPA's *Recipes for Healthy Kids and a Healthy Environment*. Lesson sections include the definitions of exposure and hazard, sources of lead in the home, and preventative measures children can take. The program was highly interactive with participation throughout and a lead detective game to summarize all the information presented. 50 children in 3rd through 5th grade participated in the program. We evaluated the program through a pre and post knowledge survey.

**Results:** Student score on the posttest increased compared to the pretest. While this quantitatively shows the potential of this program, there were also several qualitative indications of success. Despite teaching a large group of children, they were highly engaged throughout the entire program. The employees of the Boys and Girls club requested to use the program in the future.

**Discussion:** Lead exposure is a serious public health problem, especially lower income families living in older housing. Education of grade school children through after school programs appears to be one effective way of raising awareness and prevention of this problem.



# The role of social support as a predictor of adolescent mother's breastfeeding practices in Western North Carolina

Colleen Clark, *student*; Dr. Kimberly Price, *mentor*  
Lenoir-Rhyne University, Center for Graduate Studies  
Department of Public Health

This study examines the role of social support as a predictor of adolescent mother's breastfeeding rates in Western North Carolina.

**Hypothesis:** Increased instances of social support from healthcare workers, peers and family increases an adolescent mother's rate of breastfeeding as defined by months.

**Background:** According to the U.S Department of Health and Human Services [USDHHS], breastfeeding has many nutritional, immunological, and positive social health outcomes for infants (2014). One of the most vulnerable populations in the United States are adolescent mothers who have some of the lowest levels of breastfeeding, and subsequently their infants (Center for Disease Control, CDC, 2016). This research analyzes the obstacles and instances of social support that adolescent mothers encounter in Western North Carolina. Suggested effective practices are discussed to help bridge the gap between adolescent mothers and their older counterparts.

**Methodology:** To understand adolescent mothers' attitudes, practices, and social support, a written survey was developed. A non-experimental cross-sectional study design was used to assess the knowledge, attitude, current practice, future intentions, and perceptions of social support. Adolescent mothers that interact with programs at community organizations in western NC were recruited to participate in this anonymous, confidential survey. Survey items were developed using the Theory of Planned Behavior and the Life Course Development Theory.

**Results:** Preliminary results show that certain perceived obstacles such as access to a breast pump do not hold true. Evidence points to factors such as availability of time and to supportive encouragement being indicators of breastfeeding practice.

**Discussion:** There remains a need for social support to adolescent mothers. According to interviews with site program coordinators, transportation and the adolescent mothers availability of time can affect coordination of support. Connecting through the internet may be a solution to helping adolescent mothers reach their breastfeeding goals.

# A Community-Based Program to Decrease the Risk of Childhood Obesity

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Tuskegee University School of Nursing and Allied Health  
Department of Occupational Therapy

The study examines whether a program of nutrition education and physical activity will change the attitudes and behaviors of children ages 6-14 years living in a rural setting, in order to promote a healthier lifestyle.

**Research Question:** Will a program of nutrition education and physical activity change the attitudes and behaviors related to a healthy lifestyle among children ages 6-14 years living in a rural setting?

**Background:** Children are typically able to identify healthy foods as important for growth and health, but considerably less ability to reject unhealthy food items. A child's diet and activity levels play a major role in prevention of obesity. A low level of physical activity (burning 3.5 calories or less a minute) is associated with body fatness and increased risk of obesity. It is also important to teach children about healthy foods at an early age.

**Methodology:** The investigation used a quantitative, quasi-experimental method with a pre-posttest design. The dependent variable was the participant's attitudes and behaviors related to a healthy lifestyle as measured by the student developed questionnaire. The questionnaire included Likert type and open ended questions related to their activity levels and eating behaviors. The questionnaire was administered before and after the intervention. The key independent variables included one hour of health education and one hour of physical activity once a week for 18 weeks. Demographic data was also collected for each of the 11 participants (age, gender, grade level) with a short questionnaire. Cluster sampling was done among the students enrolled in the Tuskegee Youth Safe Haven program. All of the participants were African American children who live in federal subsidized housing whose families regularly utilize the community food bank to supplement weekly meals.

**Results:** The finding of the investigation indicated that a consistent program of health education and physical activity over a period of 18 weeks can improve attitudes and behaviors towards health for these children in Macon County, Alabama, provided they have access to regular physical activity and healthy food choices.

**Discussion:** Long term, the family's attitudes and resources may be a significant barrier to the participants continuing a healthy lifestyle. Among the participants there is a gap between knowing what healthy food choices are and actually choosing the healthier diet or physical activity. The continuity of this healthy lifestyle program will lead to a greater impact on the participants desire to live a healthier lifestyle.

# Building Resiliency in Middle Schoolers Through an After-School Hydroponic Farming Program

**Luis Torres**, *student*; Dr. Cappy Collins, *mentor*  
Icahn School of Medicine at Mount Sinai  
Graduate Program in Public Health

This pilot study examines the effect of a hands-on after-school hydroponic farming program and its curriculum on the health literacy and socio-behavioral development of middle schoolers who are enrolled for at least one academic quarter in the Bedford-Stuyvesant neighborhood in Brooklyn, NY (Bed-Stuy).

## **Hypothesis:**

- (1) Exposure to science, nutrition and food justice curriculum, paired with a hands-on hydroponic farm will improve student's health literacy and interest in consuming healthier foods.
- (2) Children exposed to an after-school program regularly that includes positive adult mentors and opportunities to learn will help build resiliency in the exposed children through positive youth development.

**Background:** Factors like hunger, unsafe housing, and parental instability all contribute to "toxic stress" that impairs brain development. Studies have found that poor children tend to have less gray matter in areas of the brain critical to learning and memory, which explains as much as 20 percent of the gap in test scores between poor and middle-class kids. In Bed-Stuy, the leading causes of death are almost completely associated with obesity and the neighborhood itself has many issues with crime and poverty. Together this may create high-levels of toxic stress for the children that grow up in Bed-Stuy. Through positive youth development (PYD) and increasing health literacy, these children may become better equipped to deal with the issues that they face in their daily life both in the short-term and in the long-term. There has been a lot of research into positive youth development (PYD) programs and their effects on building resiliency in children. Additionally, there have been some studies that indicate gardening programs may influence the perceptions and behavior of children towards making healthier choices.

**Methodology:** This study will use pre-post intervention surveys, focus groups and schoolwide data to investigate the effects the program has on the children.

**Results:** The study is still in progress and while the analysis is preliminary there is encouraging data on health literacy and potentially on the psycho-social effects of the program on the children that went through the program. I will also highlight a case-study from the program to highlight the potential positive effects this program has on its students.



## Summary

We have developed an approach to address the challenges of environmental health disparities that is modest, manageable, incremental and achievable. We focus on university students who are in a learning phase and are excited about making a difference in the world. We realize that we may not immediately be able to achieve our ultimate goal but, if we can establish the system and set the process in motion, our goals will be achievable in the future. In other words, we are cultivating our future leaders to improve the lives and the potential of our most vulnerable.

The model is simple: we invite students from a variety of different disciplines in universities around the United States and the world to develop projects to Break the Cycle that they can achieve in one semester. They are required to have a mentor from their academic discipline who will coach them and guide them through the research process. Some projects are descriptive and some interventional, but all of them contribute significantly to our knowledge of what the challenges are and how we may act to make a positive difference.

The Break the Cycle Program thus is a collaborative, interdisciplinary set of creative projects involving university students from different schools in different states that specifically address the challenge to *Break the Cycle of Environmental Health Disparities*. Each year, students from a variety of universities and academic disciplines are invited to submit proposals that will Break the Cycle. The application process with selection criteria judging the likelihood that the students selected will ultimately complete a project that conceptually will break the cycle in a meaningful way. This competitive process enables the selection of those projects with the most promise to become the cadre of students for that particular year. The students will then work collaborative and collectively with their academic mentors and Break the Cycle faculty, towards completion of the projects.

The process is time-limited and time sensitive. From the moment that the students have been selected, we hold conference calls with all students and mentors to have each describe the projects, the research methodology, and describe how their projects will contribute to break the cycle. These conference calls occur monthly in order to keep track of the students and keep them on track. The students and their mentors also have the opportunity during these conference calls to become familiar with the work of the other students from the other universities and disciplines and expand their understanding and appreciation for the complexity of the challenges and solutions. Completion of the project coincides with a conference in which

the students are required to present their work to their Break the Cycle peers and to a broader academic and community audience. For many, this may be their first formal public presentation. Once the project and presentation are completed, they are required to write up their work, which then is published collectively in a supplement to an international journal.

Thus, the project, the presentation, and the paper become valuable experiences and achievements for the students that will guide, shape, and support their future success.

Since its inception in 2004-2005, we have had over 118 students from 47 different departments of 32 different universities from twelve states in the continental USA as well as students from Latin America, Europe and Africa. This year, we continue our work with international students, with a student from the University of Zambia. In 2012, we conducted a survey of all the students who had been part of the program from 2004-2011 and learned that an overwhelming number –indeed, almost all – felt the project was worthwhile. Most reported that it increased their knowledge and understanding of children’s environmental health disparities and that they valued the exercise and the outcomes of their involvement in the program. Many graduates reported that they are currently involved in a similar field of practice in academic settings, in the community or in the private sector. The details of this report will be published in the near future.

The important message is that the Break the Cycle Program can make a difference in generating projects that raise awareness of children’s environmental health disparities. It inspires and cultivates a group of students for whom this program is a step towards a career and towards leadership in reducing health disparities and promoting health equity for all children, regardless of their social and economic circumstances.

## Selected Comments from Past Students on their Break the Cycle Experience

- The “Break the cycle” program was an overall success and indelible imprint in my life's journey. This opportunity was a blessing in my life that truly challenged my thought processes. Everyone involved from the students, to the faculty and staff of [Southeast] PEHSU and ISDD...everyone was such an integral part of this experience. In the imminent future, I plan to further her study of eliminating health disparities for all people through the field of public health. Ideally, I would like to further advance the horizons of public health and medicine with the goal of promoting quality, equitable health for all people.
- I believe participating in this project really helped me understand the research methods we learn in class because of the hands-on experience. I learned that I am very interested and motivated by mixed methods research (which is the method my project utilized). I also received more job opportunities when interviewers saw this experience in my resume and portfolio. Finally, going to the CDC for the SOPHE conference was life changing for me. I was so encouraged by coming to Atlanta for that meeting that I did a fellowship at the CDC after graduating with my MPH and now have moved on to work at the NIH.
- Participating in a conference where research on the cycle of disadvantage was approached from so many different angles really allowed me to experience on a deeper level the extent to which social, cultural and environmental issues are linked together and are multidimensional. And it takes experts from all corners to come together and formulate the best solution to approaching problems. “Break the cycle” helps students be more prepared and respect future work situations that require individuals from different training and philosophies to work together.
- I participated in the “Break the cycle” project my senior year of college. I am currently a third-year medical student at University of North Carolina School of Medicine. Prior to starting medical school, I participated in a year of research. The “Break the cycle” project was beneficial because it gave me more exposure to research that was non-traditional to me. However, it still helped me develop the skills necessary to conduct research and enhance leadership skills. This project was a stepping stone in the advancement in my career in medicine and science.
- The “Break the cycle” conference has allowed me to meet passionate people in the field who strive for health equity. It was an outstanding opportunity to put into practice what I had been learning in my MPH courses. Not only did I learn more about health disparities through the BTC conference, but I also gained knowledge and skills to be a better professional, collaborator, and networker- all which are vital to becoming a successful public health professional. I am thankful for the worthwhile experience and it has helped shape my decision

to pursue a PhD in public health.

- I believe “Break the cycle” has greatly shaped my career. I worked on a project about smoking and have carried forward that interest into residency, where I am currently designing a new project in the community health tract focused on the same topic. I also got invaluable research experience and learned that I really enjoy interdisciplinary interactions. Overall, BTC has been one of the most influential experiences I have had and I am very thankful to have been a part of it.
- Participating in the “Break the cycle” conference helped me to develop my future academic and career goals along with my understanding of environmental health disparities. As an undergraduate senior, being part of the BTC conference gave me insight into the different paths that I could pursue within public health after college. Before the conference, I believed I had to follow the prescribed route of an MPH to enter the public health industry. Yet I was both inspired and encouraged to see the diversity of projects from other BTC participants. These included students of medicine, law, and even architecture. It was especially rewarding for me to be able to present my work to such an esteemed audience as I had begun on this built environment project as a member of the data-collecting field team in 2008. Two years later, I was now presenting and writing a paper based on this very data that had been assembled and categorized by the collective efforts of so many of my CEHI colleagues.
- The opportunity to work with a faculty member on an original research project and to present these findings at an academic conference provided me with incredible exposure to the field. Throughout my undergraduate experience, I heard of few if any similar programs and feel incredibly fortunate to have participated in “Break the cycle”. Collaborating across universities and disciplines provided an outside-the-classroom exposure to the transdisciplinary and iterative research process required to get at the heart of issues like breaking the cycle of children’s environmental health disparities.

*\*All quotes from: Rubin et al, Break the cycle annual project: Survey of past students. 2005-2011, Int J Child Health Hum Dev 2016;9(4):441-451*



## Summary of Academic Partnerships (2005 – 2017)

### University Partners and the Departments:

- Columbia University, Mailman School of Public Health
- Clark Atlanta University, School of Social Work
- Duke University – Children’s Environmental Health Initiative
- Duke University – Trinity College
- East Tennessee State University, Quillen College of Medicine, Department of Pediatrics
- Emory University Barton Law Center
- Emory University College of Arts and Sciences
- Emory University Nell Hodgson Woodruff School of Nursing
- Emory University Rollins School of Public Health
- Emory University—Department of Anthropology
- Fort Valley State University, Department of Graduate Studies
- Fort Valley State University, Department of Veterinary Science & Public Health
- George Washington University School of Medicine & Health Sciences
- Georgia Institute of Technology, Department of Architecture
- Georgia State University Department of Educational Psychology and Special Education
- Georgia State University, Department of Public Health, Healthcare Management and Policy
- Georgia State University School of Law
- Georgia State University, J. Mack Robinson College of Business
- Harvard School of Public Health
- Hofstra University, Department of Health Professions
- Lenoir-Rhyne University, Department of Public Health
- Marquette University, Department of Physical Therapy
- Mercer University School of Medicine, Department of Community Medicine
- Morehouse School of Medicine, Department of Clinical Research
- Morehouse School of Medicine, Department of Community Health and Preventive Medicine
- Morehouse School of Medicine, Masters in Public Health
- Mt. Sinai School of Medicine, Preventive Medicine
- Pontificia Universidad Católica de Chile, Department of Pediatrics
- Spelman College, Department of Biology
- Tulane University Law School
- Tulane University, School of Public Health and Tropical Medicine
- Tuskegee University, College of Veterinary Medicine, Department of Nursing and Allied Health
- University of Cincinnati, College of Medicine, Department of Environmental Health
- University of Cincinnati, Public Health Sciences Department of Environmental Health
- University of Chicago, Pritzker School of Medicine, Department of Pediatrics
- University of Florida in Jacksonville, College of Medicine and College of Public Health
- University of Kentucky, Department of Pediatrics
- University of Michigan – Ann Arbor, School of Natural Resources and Environment



- University of Munich
- University of North Carolina-Chapel Hill, Gillings School of Global Public Health
- University of North Carolina-Chapel Hill, Department of City and Regional Planning
- University of Sao Paulo, Department of Computer Science and Mathematics
- University of Zambia, Department of Public Health
- Utah State University, Department of Sociology, Social Work and Anthropology
- Utah State University, School of Teacher Education and Leadership
- Wayne State University, School of Medicine

**Totals to Date: University Departments: 47    Students Mentored: 118**



## Conclusion

Children living in circumstances of social and economic disadvantage are at higher risk for experiencing health problems caused or exacerbated by environmental factors. They are more likely to be trapped in the cycle of environmental health disparities as a result of family stress, limited quality education, limited social capital, and lack of access to comprehensive healthcare and appropriate educational services. Furthermore, the homes and neighborhoods in which they live learn and play are inadequate at best, and may even result in a serious impact on the child's health, growth and development.

Given the current economic realities, it seems unlikely that many children and families will escape this cycle unless resources and public policies make children's health and the environment a priority.

The Break the Cycle project is a replicable means by which to promote student interest in addressing issues related to environmental health disparities. It serves as a catalyst through which academic mentors committed to issues of children's health and environmental justice can inform, guide, and inspire future professionals to become actively involved in finding creative solutions to environmental health dilemmas that the children of tomorrow will face.

Our experience from this program suggests that the incorporation of children's environmental health environmental health disparities into college curricula is likely to play an important role in shaping future leaders who will be invested in breaking the cycle of environmental health disparities.

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## **Journal Articles Published**

### **BTC III**

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### **BTC IV**

Rubin IL, Ace K, Nodvin J, Geller RJ, Marcus M, Merrick J. Vulnerable children: Break the cycle of environmental health disparities. *International Journal of Child Health and Human Development* 2010;3(4):357-453.

### **BTC V**

Rubin IL, Nodvin J, Geller RJ, Marcus M, Merrick J. Vulnerable children: Break the cycle of environmental health disparities. *Reviews in Environmental Health* 2011;26(3):135-229.

### **BTC VI**

Rubin IL, Geller RJ, Nodvin J, Marcus M, Howell M, Merrick J. Break the cycle of environmental health disparities in vulnerable children. *International Journal of Disabilities and Human Development* 2012;11(4):295-409.

#### **BTC VII**

Rubin IL, Geller RJ, Nodvin J, Marcus M, Howett M, Merrick J, eds. Break the cycle: Environmental hazards and children. *International Journal of Disabilities and Human Development* 2013;12(4):395-478.

#### **BTC VIII**

Rubin IL, Geller RJ, Nodvin J, Howett M, Gitterman BA, Merrick J, eds. Break the cycle of disadvantage and disability: Environmental factors, education, AIDS and food insecurity. *International Journal of Child Health and Human Development* 2014;7(3):207-335.

#### **BTC IX**

Rubin IL, Geller RJ, Nodvin J, Howett M, Gitterman BA, Merrick J, eds. Break the cycle of disadvantage and disability: The law, health, the environment and international perspectives ---- A birthday tribute to the pediatrician I Leslie Rubin. *International Journal of Child and Adolescent Health* 2015; 8(4):367-517

#### **BTC X**

Rubin IL, Geller RJ, Martinuzzi K, Howett M, Gitterman BA, Wells L, Garfinkel W, Coles CD, Merrick J, eds. Children's environmental health disparities. *Int J Child Health Hum Dev* 2016;9(4)

#### **BTC XI**

Rubin IL, Geller RJ, Martinuzzi K, Howett M, Gitterman BA, Wells L, Garfinkel W, Coles CD, Merrick J, eds. Break the cycle of children's environmental health disparities: An ecological framework. *Int Public Health J* 2017;9(2)



## **Pediatric Environmental Health Specialty Units**

[www.pehsu.net](http://www.pehsu.net)

The Pediatric Environmental Health Specialty Units (PEHSU) form a respected network of experts in children's environmental health. The PEHSU were created to ensure that children and communities have access to, usually at no cost, special medical knowledge and resources for children faced with a health risk due to a natural or human-made environmental hazard. Located throughout the U.S., Canada, and Mexico, PEHSU professionals provide quality medical consultation for health professionals, parents, caregivers, and patients. The PEHSU are also dedicated to increasing environmental medicine knowledge among healthcare professionals around children's environmental health by providing consultation and training. Finally, the PEHSU provide information and resources to school and community groups to help increase the public's understanding of children's environmental health.