New Science

Volume 17 | Issue 1 Article 2

9-1-2009

Changing the Course of Children's Health: Michigan Alliance for the National Children's Study

Julie O'Connor
Wayne State University


William D. Lyman, Ph.D.
Director

New Science, Vol. 17 [2009], Iss. 1, Art. 2

Changing the Course of Children's Health

Michigan Alliance for the National Children's Study

By Julie O'Connor

As a nation, we have made great advances in improving the health and development of children over the past century. However, high rates of asthma, developmental disorders, obesity, preventable injuries and a host of other problems are still a challenge for our society. While studies in recent years have offered important insights into these conditions, most have been too small or too specific to analyze the wide range of environmental factors and relationships that may impact diseases and conditions afflicting today's child.

The National Institutes of Health (NIH) is leading the most ambitious nationwide children's health research project in history – the National Children's Study – which is designed to follow children from before birth to age 21 to study the impact of the environment, broadly defined, on their health and ultimately to seek out ways to prevent many of the diseases from which children suffer. In 2007, the NIH awarded $18.5 million to the Michigan Alliance for the National Children's Study (MANCS) for study work in Wayne County, and an additional $57 million in 2008 to study children in Genesee, Grand Traverse, Lenawee and Macomb counties. Through these awards, MANCS will monitor 5,000 children in Michigan to pinpoint the root causes of many of today's major childhood diseases and disorders and determine what aspects of the environment are harmful, but also what is helpful to children's health and development.

Growing up healthy in Michigan

As part of an alliance with Michigan's top research universities, health care systems and local health agencies, MANCS' role in this nationwide study is to provide researchers, health care providers, educators and others with a resource of data that will aid in the development of prevention strategies, health and safety guidelines, educational approaches, and the hope for new treatments and cures for health conditions. And, for the first time ever, this study will allow researchers to apply knowledge of the human genome on a large scale and understand the conditions that arise from many factors including gene/environmental interactions.

The alliance is made up of Michigan State University, University of Michigan, Wayne State University, Children's Hospital of Michigan, Henry Ford Health System and the Michigan Department of Community Health. Each institution brings unique leadership to the alliance with the following roles:

Building on the Michigan Alliance for the National Children's Study

Wayne State University and Henry Ford Health System have created an inter-institutional effort to bring together and integrate the research faculty of these institutions to develop an increased understanding of the biological and social basis for health disparities among populations of differing demographics, test alternative strategies to overcome reasons for these disparities, and develop health and information management systems to support efforts to eliminate disparities altogether.

The Institute for Population Sciences, Health Assessment, Administration, Services and Economics (INPHAASE), the core of these activities, aims to investigate the problems of disease prevention and management, and health promotion in large urban areas as epitomized by metropolitan Detroit. The goal is to change individual and population behavior related to health status, as well as the behavior of health care systems and providers through collaborative research programs funded by WSU and HFHS, ultimately leading to larger scale programs and projects in these areas.

In late 2008, INPHAASE awarded four research awards totaling nearly $400,000 to develop programs that would closely associate with the National Children's Study. Each of the funded projects involve faculty from both Henry Ford Health System and Wayne State University. Awardees include:

- Andrea Cassidy-Bushrow, Ph.D., epidemiologist, Department of Biostatistics and Research

continued on page 6

Children's Health continued

Epidemiology, Henry Ford Health System, for her project, *Maternal Coping with Environmental Stress: Influences on Pregnancy and Child Health Outcomes*. This study proposes to examine the independent and interactional effects of stress, coping and emotion on pregnancy outcomes, particularly how the role of racism has prenatal factors with long-lasting health effects that may reveal targets to the earliest possible primary prevention of chronic disease in adulthood.

- Catherine Jen, Ph.D., professor and chair, Department of Nutrition and Food Science, Wayne State University for her project, *Assessments of Healthy Status of Preschoolers: A Feasibility Study.* This study aims to obtain pilot data and describe preschoolers' body weight status, diet intake patterns, and physical activity proficiency and levels in two day care centers, one which serves mostly African American preschoolers and the other which serves mostly Caucasians. These are important data that will expand upon the National Children's Study, particularly when considering the childhood obesity epidemic that is emerging as a public health crisis.
- John Reiners, Ph.D., professor, Institute of Environmental Health Sciences, Wayne State University, for his project, *Environmental and Behavioral Risk Factors for the Asthma/Allergy Epidemic: Do they Impact the Epigenome*. This study will address critical issues in the field of asthma research. Dr. Reiners and his collaborators expect to detect both 'expected' and 'new' genes in their screens and use generated information for future design of high-throughput, targeted assays that utilize amounts of blood that can be safely drawn from very young children. These assays will facilitate longitudinal epidemiological studies that address how fetal and early life diet and environmental factors affect the epigenome, and the role epigenetic changes play in influencing asthma.
- Kimberley Woodcroft, Ph.D., bioscientific staff, Department of Biostatistics and Research Epidemiology, Henry Ford Health System, for her project, *Gene-Tobacco Smoke Interactions on Child Behavioral and Cognitive Development.* This study will examine broadly defined environmental influences, including genetic, on health and development of children in the United States, aiming to identify genetic biomarkers associated with tobacco exposure and adverse child cognitive development that may aid in identifying at-risk populations for intensive parental smoking cessation intervention. This study will be the first to examine the gene-environment interaction of polymorphisms in nicotine metabolism, neural nicotinic receptors and nicotine-activated signaling pathways involved in brain development on the adverse association between maternal smoking during pregnancy and behavioral and cognitive development in children.

"This collaboration between Henry Ford Health System and Wayne State University reflects our common goals in learning how to take better care of the health needs of our community," said Dr. Gloria Heppner, associate vice president for research at WSU. "Furthermore, this joint endeavor has allowed the two institutions to develop important research collaborations in support of the Michigan Alliance for the National Children's Study, ultimately shaping the research agenda for the next generation."

Robert Sokol, M.D., director of the C.S. Mott Center for Human Grown and Development

- Michigan State University will coordinate the overall work for the study and house the project at its East Lansing campus. MSU's extension center will help develop the community support for this project. Nigel Paneth, M.D., professor of epidemiology and pediatrics, is leading this effort.
- The University of Michigan is responsible for enrolling and interviewing study participants and

New Science, Vol. 17 [2009], Iss. 1, Art. 2

William D. Lyman, Ph.D., director of the Children's Research Center at Children's Hospital

assessing postnatal child development. This is led by Daniel Keating, Ph.D., professor of psychology.

- Wayne State University will oversee the assessment and care of pregnant women. This effort is led by Robert Sokol, M.D., director of the C.S. Mott Center for Human Growth and Development, and distinguished professor of obstetrics and gynecology.
- Children's Hospital of Michigan will manage biological samples, and is led by William Lyman, Ph.D., director of the Children's Research Center at Children's Hospital and associate department chair of pediatrics at Wayne State.
- Henry Ford Health System will manage environmental samples and perform medical examinations of children. These efforts are led by Christine Cole Johnson, Ph.D, MPH, senior staff epidemiologist and interim department chair, Department of Biostatistics and Research Epidemiology, Henry Ford Hospital and Health System and Charles Barone, M.D., FAAP, chair, Department of Pediatrics, Henry Ford Medical Group; division chief, Division of Pediatric Hospitalist Medicine, University Pediatricians/ Children's Hospital of Michigan; clinical associate professor of pediatrics, Wayne State University School of Medicine; and president, Michigan Chapter of the American Academy of Pediatrics.
- The Michigan Department of Community Health will provide information related to live birth characteristics and locations in the study, and is led by Violanda Grigorescu, M.D., director of the Division of Genomics, Perinatal Health and Chronic Disease Epidemiology.

"Working cooperatively with the other major biomedical institutions in the state allowed us to bring together a team of unmatched expertise," said Dr. Sokol. "It also assured that our joint efforts would be adequately funded so that we will be able to perform all portions of the study well," he added.

The National Children's Study will provide health and economic benefits through reduced illness and disability, as well as increased school and work productivity, ultimately profiting the nation well beyond the investment of creating and maintaining this important study. By evaluating environmental exposures in relation to genetic predispositions to health and disease among the 100,000 participating children nationwide, a more complete picture of what actually causes diseases and promotes health will be realized. The end result may not be prevention or treatment for every childhood health problem, but certainly a repository of data from which new preventions and treatments can be developed for today's most common health disorders.

"The National Children's Study will provide critical information to help guide the treatment, cure and, hopefully, prevention of many childhood diseases," said Dr. Lyman. "It is important to remember that these children will become adults and what we learn about their development can have profound implications for adult disease and well-being also. The results of this study will transform maternal and child health and development for the next 50 to 100 years. This is the most important research initiative that has ever taken place and will allow our children, grandchildren and great-grandchildren to reap many benefits in the future."