

Division of Epidemiology & Biostatistics

DIVISION PROFILE

Number of Faculty	15
Number of Joint Appointment Faculty	4
Number of Fellows	
Research Fellows	5
Number of Graduate Students	2
Number of Support Personnel	20
Annual Total Grant Support (direct)	\$1,601,829
Annual Total Industry Contracts (direct)	\$170,482
Number of Peer Reviewed Publications	54

FACULTY LISTING

Ardythe L. Morrow, PhD, Professor of Pediatrics, Director, Center for Epidemiology & Biostatistics
Mekibib Altaye, PhD, Assistant Professor of Pediatrics
Judy A. Bean, PhD, Professor of Pediatrics, Director, Biostatistics
Adekunle H. Dawodu, MBBS, Professor of Pediatrics, Director, International Health
Gerry Fairbrother, PhD, Professor of Pediatrics, Director, Health Services Epidemiology
Sheela Geraghty, MD, MS, Instructor of Pediatrics
Richard Hornung, Dr. PH, Professor of Pediatrics
Bin Huang, PhD, Assistant Professor of Pediatrics
Louise Lawson, PhD, Assistant Professor of Pediatrics
Lisa J. Martin, PhD, Assistant Professor of Pediatrics
Cynthia A. Molloy, MD, Instructor of Pediatrics
Todd Nick, PhD, Professor of Pediatrics
Josefa Rangel, MD, Instructor of Pediatrics
Siva Sivaganesan, PhD, Professor of Pediatrics, Professor of Mathematics
Jessica G. Woo, PhD, Assistant Professor of Pediatrics

FACULTY JOINT APPOINTMENT LISTING

Gerry Fairbrother, PhD, Professor of Pediatrics, Health Policy and Clinical Effectiveness
Sheela Geraghty, MD, MS, Instructor of Pediatrics, General and Community Pediatrics
Richard Hornung, Dr, PH, Professor of Pediatrics, General and Community Pediatrics
Siva Sivaganesan, PhD, Professor of Pediatrics, Professor of Mathematics, A&S Mathematical Sciences

OVERVIEW

The Center for Epidemiology and Biostatistics (CEB) was established in 2001 to advance the capacity of Cincinnati Children's for clinical, translational, and population-based research that contributes to improving child health. The overall CEB is directed by Dr. Ardythe Morrow; the biostatistics section is directed by Dr. Judy Bean. During FY06, there were eleven faculty with primary appointments in the CEB: in epidemiology, Drs. Ardythe Morrow, Adekunle Dawodu, Gerry Fairbrother, Lisa Martin, Cynthia Molloy, Josefa Rangel, and Jessica Woo; in biostatistics, Drs. Judy Bean, Mekibib Altaye, Bin Huang, and Todd Nick. In addition, there were four faculty with joint, secondary, or adjunct positions in the CEB: Drs. Sheela Geraghty and Rick Hornung, (shared with General and Community Pediatrics), M. Louise Lawson (adjunct), and Siva Sivaganesan (shared with Department of Mathematics).

The CEB faculty conduct independent research and interact with nearly all divisions of CCHMC to provide consultation and core support for the research programs of many pediatric investigators, research mentorship for junior investigators, and teach in research training programs for residents, fellows, and graduate students. The independent research of CEB faculty involves the application of epidemiologic and statistical methods to interdisciplinary collaborations that examine genetic, behavioral, environmental, medical or social (policy) risk

factors for disease and the effectiveness of interventions that could be used to prevent or treat diseases in children. The common theme of the CEB is thus methodology for the design and conduct of research and the analysis of biomedical research data.

The largest independent research program of the CEB is research on human milk and breastfeeding, most specifically, the bioactive factors in human milk that may prevent infectious and chronic diseases in breastfed infants and the specific mechanisms by which these factors may affect health over the life course. CEB epidemiology faculty also study the genetic epidemiology of complex diseases such as obesity, diabetes, and autism spectrum disorder; immune phenotypes; the impact of obesity on child and adolescent health; factors in early childhood that are associated with later development of obesity; the effectiveness of medical and surgical treatments on health outcomes in children; the impact of Medicaid policy on child health status; studying the use of new vaccines in pediatrics to prevent major infectious diseases; and understanding Vitamin D deficiency as an international maternal and child health problem.

In biostatistics, faculty continue to provide expert support to many divisions and programs at CCHMC and UC. As the program in biostatistics grows, however, the faculty are increasingly specialized and a program of biostatistical research is emerging in the areas of mediational modeling, Bayesian statistical methodologies, imaging biostatistics, and pharmacogenomic analysis.



Left to Right: (1st row) J. Woo, B. Huang, L. Martin, A. Dawodu, (2nd row) J. Bean, S. Geraghty, T. Nick, C. Molloy, A. Morrow, M. Altaye

HIGHLIGHTS

During the FY06 academic year, the Center for Epidemiology and Biostatistics (CEB) had a total of 35 faculty and staff, and added Dr. Jessica Woo in epidemiology (primary appointment), and Dr. Rick Hornung in biostatistics (joint appointment with General and Community Pediatrics). CEB faculty mentored six trainees this past year – two medical students, four graduate students, and five Bang Bao pediatric scholars from diverse cities of China.

This was a productive year. CEB faculty authored more than 50 manuscripts published in peer-reviewed journals, including the first report of the presence of adiponectin in human milk (Martin et al, 2006); two novel studies by Molloy et al reporting an association between autism and immune dysregulation; and two novel studies by Woo, Martin, and Dolan et al from the Princeton study on factors affecting plasma adiponectin, including haplotypes in the adiponectin gene ACDC. These lines of investigation are being avidly pursued.

As of the end of FY06, the CEB had 12 independent extramural grants and contracts, which provided approximately \$1.6 million in direct costs (FY06 only), and was involved with more than 40 CCHMC grants and contracts, worth more than \$75 million in total direct costs. Dr. Huang successfully competed for an R01 from the National Institute of Drug Abuse (NIDA), entitled, "Innovative Modeling of Puberty and Substance Use Risk." This grant, which involves collaboration with Dr. Lorah Dorn and others in Adolescent Medicine,

applies and develops novel statistical methods to better understand the dynamics of adolescent development. Dr. Fairbrother was awarded a R40 grant from the Health Resources and Services Administration to study insurance instability impact on children, and from the California Endowment to study the stability of insurance in relation to the cost of public programs. Dr. Woo successfully competed for an intramural grant for junior faculty – the Trustee award – and an R21 from the National Institute of Child Health and Human Development (NICHD) to study the role of adiponectin in child health and growth (start date FY07). Dr. Geraghty received a K23 grant from the National Institute for Environmental Health to study the effects of environmental contaminants on mothers' ability to breastfeed. Dr. Molloy was competitively selected for the prestigious Charlotte R. Schmidlapp award, which is awarded to one woman scholar at Cincinnati Children's each year.

Other grants were successfully continued. Dr. Bean had NIH funding for the biostatistics core of the GCRC and two multi-site studies. Dr. Nick continued his subcontract from University of Mississippi. Dr. Martin continued her American Diabetes Association career development award, subcontracts for statistical genetic analysis of NIH-funded studies, and her research on the SCCOR grant with Dr. Woody Benson. Dr. Morrow's program project on the role of human milk in infant nutrition and health completed the third of five years, and she was awarded two industry contracts. In addition, CEB faculty were co-investigators on 26 externally funded grants awarded to principal investigators in other CCHMC divisions.

CEB faculty and trainees were visible in professional conferences and societies locally, nationally and internationally. Dr. Morrow became President-Elect of the International Society for Research in Human Milk and Lactation. At the International Biostatistics Society Eastern North American Region meeting, Dr. Nick organized and chaired two sessions, and Dr. Altaye was an invited speaker. Drs. Geraghty and Morrow chaired a session at the Pediatric Academic Societies meeting. Dr. Morrow agreed to serve on the editorial board of Breastfeeding Medicine. Dr. Bean served on several grant review panels and on the editorial board of Statistical Methods in Medical Research. Dr. Martin served on the executive board of the American Association of Anthropological Genetics. CEB faculty served as peer reviewers for more than ten journals.

Dr. Altaye organized the CEB journal club and Dr. Martin organized the research-in-progress meeting. CEB faculty and staff taught in the genetic counseling program, the dental graduate program, the neonatology fellowship program, the GCRC Clinical Research seminar series, the UC Department of Environmental Health Epidemiology Seminar, the CCHMC Genetics seminar, and CEB seminars. The faculty also served on many institutional committees and Data Safety and Monitoring Boards.

The CEB had its first Scientific Advisory Committee (SAC) review. The reviewers were Dr. Dick Landis (biostatistics) from University of Pennsylvania, Dr. Michelle Williams (epidemiology) from University of Washington, and from Cincinnati Children's, Drs. Jim Heubi and Thomas DeWitt. As a result of a highly encouraging review, the business plan of the CEB is being revised, and CEB recruitments will be continued to support CCHMC's Strategic Plan.

GRANTS, CONTRACTS AND INDUSTRY AGREEMENTS

Grant and Contract Awards	Annual Direct/Project Period Direct
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Bean, J Recanalization Therapies and Markers of Outcomes in Acute Ischemic Stroke National Institutes of Health (University of Cincinnati subcontract) P50 NS 442853	09/30/02 – 08/31/07 \$101,183/\$413,000
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Fairbrother, G Stability and Cost of Public Insurance Programs The California Endowment	01/01/06 – 12/31/06 \$137,678

How Insurance Instability Impacts Children

Health Resources and Services Administration

R40 MC 06633

01/01/06 – 12/31/07

\$78,103/\$165,608

Huang, B

Innovative Modeling of Puberty and Substance Use Risk

National Institutes of Health

R01 DA 019965

04/10/06 – 12/31/09

\$153,913/\$603,257

Martin, L

Sexual Maturation and Common Genetic Polymorphisms in Adolescents on

Adiponectin

American Diabetes Association

07/01/03 – 06/30/08

\$131,598/\$586,341

Genomic Dissection of a QTL Affecting the Lipid Profile

National Institutes of Health (Medical College of Wisconsin)

R01 HL 074168

07/01/03 – 06/30/08

\$26,070/\$98,173

Genetics of CRP in Families with Myocardial Infarction

National Institutes of Health (Medical College of Wisconsin)

R01 HL 074321

07/01/03 – 06/30/08

\$11,986/\$59,140

Morrow, A

Role of Human Milk in Infant Nutrition and Health

National Institutes of Health

P01 HD 013021

06/30/03 – 03/31/08

\$944,091/\$4,699,005

Morrow, A

\$ 96,622

Administrative Core

Morrow, A

\$153,730

Epidemiology Core

Jiang, X

\$100,542

Molecular Biology Core

Jiang, X

\$134,374

Gastroenteritis Project

Nick, T

TBI Model System of Mississippi

Department of Education (Methodist Rehabilitation Center subcontract)

H13 3A 020514

11/01/05 – 09/30/07

\$17,207/\$36,841

Current Year Direct

\$1,601,829

Industry Contracts

Morrow, A

Bristol Meyer Squibb/Mead Johnson

\$13,321

P&G China Bang Bao Scholar Program

\$150,000

Molloy, C

PediaMed Rx

\$7,161

Current Year Direct Receipts

\$170,482

TOTAL

\$1,772,311

PUBLICATIONS

1. Meizen-Derr JK, Guerrero ML, Altaye M, Ortega-Gallegos H, Ruiz-Palacios GM, Morrow AL. Risk of infant anemia is associated with exclusive breast-feeding and maternal anemia in a Mexican cohort. J Nutr 2006;136(2):452-8.
2. Szaflarski JP, Schmithorst VJ, Altaye M, Byars AW, Ret J, Plante E, Holland SK. A longitudinal functional magnetic resonance imaging study of language development in children 5 to 11 years old. Ann Neurol 2006;59(5):796-807.

3. Amin R, Bean J, Burklow K, Jeffries J. The relationship between sleep disturbance and pulmonary function in stable pediatric cystic fibrosis patients. *Chest* 2005;128(3):1357-63.
4. Franko DL, Striegel-Moore RH, Bean J, Barton BA, Biro F, Kraemer HC, Schreiber GB, Crawford PB, Daniels SR. Self-reported symptoms of depression in late adolescence to early adulthood: a comparison of African-American and Caucasian females. *J Adolesc Health* 2005;37(6):526-9.
5. Franko DL, Striegel-Moore RH, Bean J, Tamer R, Kraemer HC, Dohm FA, Crawford PB, Schreiber G, Daniels SR. Psychosocial and health consequences of adolescent depression in Black and White young adult women. *Health Psychol* 2005;24(6):586-93.
6. Martin VT, Wernke S, Mandell K, Ramadan N, Kao L, Bean J, Liu J, Zoma W, Rebar R. Defining the relationship between ovarian hormones and migraine headache. *Headache* 2005;45(9):1190-201.
7. Martin VT, Wernke S, Mandell K, Ramadan N, Kao L, Bean J, Liu J, Zoma W, Rebar R. Symptoms of premenstrual syndrome and their association with migraine headache. *Headache* 2006;46(1):125-37.
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11. VanCott JL, Prada AE, McNeal MM, Stone SC, Basu M, Huffer B, Jr., Smiley KL, Shao M, Bean JA, Clements JD, Choi AH, Ward RL. Mice develop effective but delayed protective immune responses when immunized as neonates either intranasally with nonliving VP6/LT(R192G) or orally with live rhesus rotavirus vaccine candidates. *J Virol* 2006;80(10):4949-61.
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13. Dawodu A, Agarwal M, Hardy D, Kochiyil J. Contributions of sunshine deprivation and maternal vitamin D deficiency to rickets in the United Arab Emirates. *Emirates Med J* 2006;24(1):20-35.
14. Dawodu A, Agarwal M, Sankarankutty M, Hardy D, Kochiyil J, Badrinath P. Higher prevalence of vitamin D deficiency in mothers of rachitic than nonrachitic children. *J Pediatr* 2005;147(1):109-11.
15. Dawodu A, Tsang R. Sunshine deprivation rickets: a maternal-infant health problem. *Middle East Paediatr* 2005;10(4):102-104.
16. Dawodu A, Varady E, Nath KN, Rajan TV. Neonatal outcome in the United Arab Emirates: the effect of changes in resources and practices. *East Mediterr Health J* 2005;11(4):673-9.
17. Fairbrother G, Haidery A. How health insurance stability impacts the quality of health care. In: *Health Policy Program. Issue Brief* [online]. Washington, DC: New America Foundation; 2005. Available: <http://www.newamerica.net/index.cfm?pg=publications&DocType=5>
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19. Fairbrother G, Scheinmann R, Osthimer B, Dutton MJ, Newell KA, Fuld J, Klein JD. Factors that influence adolescent reports of counseling by physicians on risky behavior. *J Adolesc Health* 2005;37(6):467-76.
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21. Geraghty SR, Khoury JC, Kalkwarf HJ. Human milk pumping rates of mothers of singletons and mothers of multiples. *J Hum Lact* 2005;21(4):413-20.
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23. Lanphear BP, Hornung R, Khoury J, Yolton K, Baghurst P, Bellinger DC, Canfield RL, Dietrich KN, Bornschein R, Greene T, Rothenberg SJ, Needleman HL, Schnaas L, Wasserman G, Graziano J, Roberts R. Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. *Environ Health Perspect* 2005;113(7):894-9.
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