



## REPORT to MICYRN

### PLANNING WORKSHOP

for

**Canadian Birth Cohort Research Network**

*Réseau Canadien de Recherche sur les Études Cohortes*

Held APRIL 3-4, 2009

Toronto, ON, Canada

Supported by a Grant from MICYRN

maternal infant  
child & youth  
research network



réseau de recherche  
en santé des  
enfants et des mères

**Canadian Birth Cohort Research Network**  
*Réseau Canadien de Recherche sur les Études Cohortes*

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## Workshop Objectives

### Canadian Birth Cohort Research Network

#### *Réseau Canadien de Recherche sur les Études Cohortes*

##### The key objectives of the Network Workshop were:

1. To formalize the **Canadian Birth Cohort Research Network/** by establishing personal connections between the multi-disciplines of the leading investigators and key researchers involved in birth cohort studies in Canada.
2. To familiarize investigators with details of existing cohort studies established internationally and within Canada and to develop a national registry of Canadian Birth Cohort studies.
3. To develop collaborations between existing cohorts for the purpose of sharing research design, methods, tools of assessment (e.g., questionnaires, diet and physical activity measurements etc) that will serve to standardize data collection and optimize future collaborative data analysis.
4. To obtain expert guidance on developing a Canada-wide merger of birth cohort databases from the perspective of ethics at the regional and national levels, database management, biobanking, genetic testing, training, publication and knowledge translation partners key for delivery of results to impact on practice guidelines and health policy.
5. To establish research questions, using the combined existing databases/ biologic samples that would benefit from the large sample size; and to propose new data to be collected from participants agreeing to follow-up studies;
6. To develop a plan for trans-disciplinary training in research in the field of early determinants of healthy pregnancies and child development.
7. To obtain a consensus on planning for next steps for the development of CBCRN.



## Workshop Program

**Local Organizer/Co-Chair:** Stephanie Atkinson, PhD, Professor and Associate Chair (Research) of Pediatrics, McMaster University

**Program Co-Chairs:** Alan Bocking, MD, FRCPC, Chair of Obstetrics & Gynecology, University of Toronto and Chief of Obstetrics, Mount Sinai Hospital, University of Toronto

Victor Han, MD, FRCPC, Director, Children's Health Research Institute and Associate Dean - Research, Schulich School of Medicine and Dentistry, University of Western Ontario

### **Day 1 – Friday, April 3, 2009**

0730 – 0800 *Continental Breakfast*

0800 – 0815 **Welcome and Introduction:** The MICYRN Connection: A perspective on the history & future of Canadian Birth cohort collaborations  
- **Stephanie Atkinson**

### **Keynote Presentations – (see Appendix I for brief bios of keynote speakers)**

0815 – 0900 Longitudinal birth cohort studies: a practical perspective  
**Malcolm Sears**, McMaster University

0900 – 0945 Developmental Health: Integrating populations and animal models  
**Stephen Lye**, University of Toronto

0945 – 1015 Visions for Future of Canadian Birth Cohorts.  
**Michael Kramer**, Scientific Director, CIHR - IHDCYH

1015 – 1045 *Health Break*

### **Introduction of Birth Cohorts**

1045 – 1230 **Overview of research objectives, outcome measures and current status of study. (see Table Appendix II for list of all Cohort Studies & PIs)**

- Étude Longitudinale du développement des enfants du Québec (ELDEQ-LSCDQ)  
**Bertrand Perron** (Statistiques Quebec)
- Early Pregnancy Markers for Pre-eclampsia (PreMark)  
**Linda Dodds** (U Dalhousie)

- The Next Generation: Offspring of Mothers with Early Onset Type 2 Diabetes (Next Gen)  
**Heather Dean** (U Manitoba)
- Nutrition and Exercise Lifestyle Intervention Program (NELIP)  
**Michelle Mottola** (UWO)
- Insulin Resistance and Beta Cell Dysfunction in Early Childhood: The Role of Maternal and Infant Metabolic Risk Factors  
**Jill Hamilton** (U Toronto)
- Ottawa and Kingston Birth Cohort Study (Oak)  
**Shi-Wu Wen** (U Ottawa)
- Family Atherosclerosis Monitoring in Early Life (FAMILY)  
**Stephanie Atkinson** (McMaster U)

1230-1315

*Lunch Break – Buffet in Foyer outside Zermatt Room*

### **Introduction of Birth Cohorts - continued**

1315 – 1500

- Impact of exercise and nutrition on excessive GWG, GDM, macrosomia and child growth (IDEA)  
**Garry Shen** (U Manitoba)
- Role of intra-uterine inflammation as a determinant of future disease (PreDICTR)  
**Alan Rosenberg** (U Saskatchewan)
- Canadian Health Infant Longitudinal Development (CHILD) Study  
**PJ Subbaro** (U Toronto) & Malcolm Sears (McMaster U)
- Maternal-Infant Research on Environmental Chemicals (MIREC)  
**Tye Arbuckle** (Health Canada) & William Fraser (U Montreal)
- Integrated Research Network of Perinatology of Quebec (IRNPQEO)  
**Tye Arbuckle** (Health Canada) & William Fraser (U Montreal)
- All Our Babies Cohort (AOB)  
**Suzanne Tough** (U Calgary)
- Alberta Pregnancy Outcomes and Nutrition (APrON)  
**Catherine Field** (U Alberta)
- Role of Repeated Antenatal Steroids on Neonatal/Perinatal Morbidity (MACS and MACS-5) *[to be presented on Saturday]*  
**Elizabeth Asztalos** (U Toronto)

1500 – 1515

*Health Break*

1515 – 1800

**Methodologies for longitudinal cohort studies  
– sharing of methods and tools of measurements**

- Recruitment & retainment – **Bertrand Perron** (ÉLDEQ)
- Environmental contaminants – **Tye Arbuckle** (MIREC)
- Inflammation – **Alan Rosenberg** (PreDICTR)
- Nutrition – **Lise Dubois** (ELDEQ-LSCDQ)
- Physical activity – **Michelle Mottola** (NELIP), **Gary Shen** (IDEA)
- Developmental health – **Catherine Field** (APrON)
- Gene/environment interactions – **Stephen Lye**
- Allergy/asthma – **Malcolm Sears** (CHILD)
- Working with Founding Peoples – **Heather Dean** (Next Gen)

7:00 pm

**Dinner**

**Day 2 (half-day) – Saturday, April 4 from 0800- 1300 hr**

0730 – 0800

*Continental Breakfast*

**Expert Advice on Functional Aspects of CBCRN Collaborations (Speaker Bios in Appendix I)**

0800 – 0830

Ethics Challenges in Cohort Databases  
**Denise Avard** (U Montreal), Chair, MICYRN Ethics & Regulatory Core

0830– 0900

Approaches to database management of combined cohorts  
**Anne Junker** (UBC), Member of MICYRN Database Core

0900 – 0930

How to achieve success in establishing health research networks and databases  
**Shoo Lee** (U Toronto), Director of Canadian Neonatal Network

0930 – 0945

Discussion on ideas for network/databases

0945-1000

*Health Break*

1000-1045

Target Research Agenda – immediate and long-term goals  
– 4 break out groups to generate ideas for future collaborations  
Facilitator - **Stephanie Atkinson**

1045 – 1230

Report back on Research Agenda – one rapporteur from each group  
- group input on future development of CBCRN and next steps

1230 – 1300

Summary – next steps – report to MICYRN  
**Alan Bocking, Stephanie Atkinson**

## Report of Workshop Activities

### **1. Rationale for Development of Canadian Pregnancy/Birth Cohort Research Network**

Emerging evidence from epidemiologic and animal studies support the hypothesis of an interaction effect of genes and environmental exposures during embryonic, fetal and neonatal life on birth outcomes, and growth and body composition of progeny and also on long term risk of chronic diseases. Determining childhood and fetal antecedents of disease will have profound implications for treatment and prevention. Many diseases are considered to have multifactorial origins. Our proposed Network, by integrating complementary birth cohort teams, will have the realistic potential to investigate the multiple, inter-related early determinants of future disease.

The proposed goal to develop a **Canadian Birth Cohort Research Network** was to provide formal linkages between the existing diverse and experienced investigators who by working collaboratively will ally with and complement existing research that is truly transdisciplinary, and integrates biomedical, clinical, social, and environmental health research. Our proposed Network will help transcend the independent successes of existing research groups by achieving added value fostering collaboration among groups. The creation of a Network will strengthen birth cohort research capacity in Canada by conceiving of and implementing innovative research agendas, increase capacity providing an attractive and vibrant environment to attract new scientists, mentor colleagues, train students, and develop and secure sustainable infrastructure resources and funding. The CBCRN Workshop brought together leaders of sixteen existing cohort studies to explore the commitment to collaboration between cohort studies and to develop a plan of how to ensure the development and viability of such a Network. By working together on studies of determinants of maternal, infant and child outcomes, we can ensure a continuum of research and translation to care of mother and child without the usual sub-specialty boundaries of obstetrics, neonatology and pediatrics in various sub-specialties. The ultimate goal of the collaborative work of the **Canadian Birth Cohort Research Network** will be to translate knowledge from our collective research into improved practice of our respective professions in the delivery of guidance to parents and children for healthier pregnancies and optimal growth and development with disease risk reduction in the offspring.

### **2. Activities of Workshop**

Enthusiasm for developing a country-wide network to facilitate collaborations in pregnancy/birth cohort research was exemplified by the fact that 16 out of 17 of the independent studies invited to the Workshop attended, most being represented by the Principal Investigator. As noted in the list of existing pregnancy and birth cohorts provided in Appendix II, the research themes of the 16 identified cohorts are quite diverse. Yet many commonalities exist across cohorts in outcome measurements employed although the tools used may be variable. While the preponderance of funding support for these cohort studies is from CIHR, research support has also derived from provincial and disease specific agencies. To date, CIHR has not played a role in coordinating the research investigations among the cohort studies being funded by them.

Appreciation of the specific research questions, design and outcome measures, as well as progress to date of international birth cohorts was presented by the two keynote speakers (Drs.

Lye and Sears). Both speakers provided their perspective on niche opportunities to advance research through collaborations among Canadian cohort studies. The overview of each of the existing Canadian cohort studies represented was illuminating and served to foster a collective view that there was much to be gained by learning of the details of each others studies, sharing insights into the pitfalls and challenges of conducting longitudinal cohort studies, possible approaches to solving such barriers, and the sharing of measurement tools.

Another sector of the presentations by experts from the cohort teams, focused on detailing specific measurement tools on areas of recruitment and retainment of subjects, assessment of environmental contaminants, of inflammation, nutrition and physical activity, allergy/asthma and approaches to assessment of developmental health. The area of investigation of gene-environment interactions was of great interest to all cohort groups since this is an emerging area of investigation. Dr. Stephen Lye provided an international perspective on genetic analysis being conducted in cohort studies abroad and the type of gene-environment relationships being examined. He then provided sage advice on the methodology required to conduct such genetic studies appropriately and the need for expert analytical facilities. Finally, inclusion of Aboriginal, First Nations and Metis populations in birth cohort studies was identified as an important goal for the future.

With a view to exploring infrastructure needs in the development of a Canadian network of cohort studies, three key experts provided plenary presentations to address major areas that need attention in establishing a network for the purpose of child health research. First, the challenges and rewards of setting up national networks were described by Dr. Shoo Lee, pioneer of the Canadian Neonatal Network. He underlined the importance of having a well defined purpose for the Network, strong leadership (someone who is passionate about the Network), and inclusive membership. He also emphasized the need for a strong and flexible infrastructure (including a representative steering committee) that has capacity for training and is scalable, is disseminated versus centralized, has political antennae and has the responsibility to secure ongoing funding support. The accessibility of network information not only to the core participants but through linkages with community partners, funding agencies, government agencies or other relevant groups is important for the sharing of knowledge. Finally, a plan for knowledge translation that will impact on clinical practice management and health policy to improve the health of women and children is tantamount to the worthiness and success of a network.

Dr. Anne Junker addressed the need for databases that can accommodate merging of large datasets across cohort studies. Clearly, software is becoming available to achieve such goals. Programs such as visual analytics can facilitate the merging of data with different formats into one database. Again, database management could be a key role for MICYRN to support infrastructure for the CBCRN.

## **2. Proposals generated by Workshop participants**

After amassing the vast array of information gleaned from presentations by both experts and investigators of existing birth cohorts, the feasibility and benefits of collaboration amongst existing cohorts were fleshed out in break-out group discussions with report back to the whole group. The key questions probed through group discussions and the proposals delineated at the conclusion of the Workshop were as follows:

- **What are the benefits/negatives of establishing a formal Canadian Birth Cohort Research network?**

There was unanimous enthusiasm for linking existing and future cohort studies, and the most practical means is a formal network under the auspices of MICRYN so as to have the advantage of the support of several of the MICRYN core platforms. Coordination through MICRYN would provide a centre for development of virtual databases that could house a) a registry of Canadian birth cohort studies; and b) a repository for filing measurement tools such as questionnaires and analytical methods that could be shared with other studies and available upon registration in the CBCRN. Such collaborations would provide for validation and quality assurance in application of measurement tools. Linkage of birth cohort databases to health care and other databases could also be facilitated by MICRYN to ensure a bidirectional flow of information.

Other elements of such a network would include teams of experts representing disciplines who could then serve as expert consultants to projects and collaboration across studies in areas of mutual interest in order to increase sample size or obtain a diversity of population sample so as to be more generalizable to the Canadian population. The future might include linking of biological specimens although major challenges also exist. It was determined that coordination of such activities would be greatly facilitated if MICRYN played a facilitatory role. Potential barriers to successful establishment of a cohort network were identified as money, governance and engagement of each cohort with appropriate returns, and identification of a champion with the passion and leadership capabilities for such a project. Such barriers would be minimized if the network was formed under the auspices of MICRYN. MICRYN could establish policies for partnership of birth cohorts with the Canadian Neonatal Network. Another idea was for MICRYN to propose a birth cohort registry as a pre-requisite for funding, e.g. clinical trials, something thought to be socially responsible.

Another argument for the CBCRN to exist under MICRYN is the potential for advocacy for birth cohort studies, their value to potential funders and the general community. Future funding support will be critical to maintaining the cohorts to be able to assess the effect on future health in the subjects. MICRYN could be the public “voice” for birth cohort studies to make the case to CIHR institutes and provincial funding partners. The role of IHDCYH could focus on engaging other CIHR institutes and the knowledge translation emanating from research findings from the birth cohort studies that are applicable to improving health care policy and services.

- **What is the value of existing versus new population-based birth cohort studies?**

Although a population-based cohort study had been proposed through IHDCYH, it was not funded in the last budget and is unlikely to go forward under the current government (the proposal had been for a cross-Canada study of 30,000 mother-infant pairs at a projected cost of \$200 M). The assembled investigators felt strongly that collaboration amongst existing cohorts could yield real added value and serve much of the purpose of conducting a new separate birth cohort.

From the data collected on the existing birth cohort studies, it is apparent that more than 32,000 mother/infant pairs are being studied in active longitudinal prospective research projects that represent at least seven provinces. For a further 40,000 mother/infant pairs data also exist although some of these data were collected retrospectively. It was felt that while the existing studies do not represent an *a priori* established population-based cohort study, that many benefits exist for establishing formal collaborations rather than a new national cohort not the least of which is cost savings since considerable sums of money are already invested in the existing cohorts and they do have relatively good national representation. An additional advantage of the multiple studies is that there will be more information collected (at least biomarkers and short-term outcomes) on these smaller cohorts than one could ever get from a single cohort due to subject burden.

- **What are priority activities for collaboration among existing birth cohort studies?**

It was pointed out that most existing studies are not powered for long-term outcomes such as childhood diseases or biomarkers with predictive value to later disease. As the Network evolves key expertise is required such as a methodologist who can guide the combining of data sets amongst cohorts after we define specific research questions to address. Expertise in knowledge translation is important not only to communicate the importance of birth cohort studies but to translate the findings to practice guidelines and policy. The Knowledge Translation Core of MICYRN would be instrumental in facilitating this activity of CBCRN.

Other objectives proposed for the CBCRN were to foster transdisciplinary training of health care professionals and others who play key investigator roles in birth cohort studies. This will ensure the longitudinal success of existing and newly established cohort studies. While those present at the workshop were primarily involved in human studies, the importance of animal models to explore mechanisms of programming was recognized as an essential element of research focused on the determinants of health and disease outcomes. The associations established in the cohort studies could be employed by basic scientists to design hypothesis-driven basic biomedical studies aimed at identifying mechanisms. To this end, it was suggested that the CBCRN might expand to include basic scientists such as molecular biologists, physiologists and geneticists working in research such as developmental programming.

- **What approach should be used to develop a collaborative research agenda among existing cohort studies?**

Despite the obvious challenges that exist in establishing effective productive networks in health research, in the organization and management of large research databases and in issues related to ethics from a national perspective, the assembled investigators remained undaunted in their desire to proceed to develop a national birth cohort network.

Approaches to urgent issues that will impact on collaborations between inter-provincial study sites were discussed. MICYRN could play a leadership role in attaining improved consensus of the practice of ethics review for maternal and child health across the country. For example, the ethical issues surrounding potential inter-provincial study sites and merging of existing data bases was explored through the presentation by Dr. Denise Avard,

Chair of the MICYRN Ethics and Regulatory Affairs Core Group. A detailed summary of issues related to ethics is provided in Appendix III.

An approach to developing research questions that can be addressed by combining cohort data is for MIYCYRN to hold an annual workshop to explore emerging research questions and tools. CIHR institutes might establish an RFA for emerging questions in birth cohorts. For example, the Institute of Aboriginal People's health might have interest in partnering with MICRYN birth cohorts to focus questions on indigenous peoples. Interactions with public and policy groups would help to identify areas in need of a knowledge base.

Merging of relevant data from existing cohorts would allow subgroup analysis such as all ethnic minorities. It was recommended that one start with a single high level important question such as obesity in children: and the impact of parity, maternal BMI etc on obesity outcome. To facilitate such research, standardization of measurement tools would be an asset such as for standardization of ethics submissions, Case Report Forms, and questionnaires for physical activity, neurodevelopment, nutrition, physical environment, phenotype of mothers, childhood growth patterns.

To fully explore a collaborative research agenda for CBCRN, a future workshop will be necessary. In the meantime, the building of the virtual infrastructure and means to sharing of measurement tools and protocols must take priority.

## **Next Steps**

### **Development of CBCRN**

1. First steps in formal development of a Canadian Birth Cohort Research Network
  - Consult with Co-Directors of MICYRN with regard to interest in being establishing the CBCRN as a project.
2. Set up the infrastructure and governance of CBCRN to begin to foster and coordinate collaborations between existing birth cohort studies. This should prioritize plans to address urgent issues relevant to collaboration among birth cohort studies such as the sharing of consent and assent forms and REB procedures.
3. Establish a registry for existing and new pregnancy and birth cohort studies in Canada. Set up a mechanism for outreach to identify other existing cohort studies. Consider broadening the inclusiveness to include other maternal and child longitudinal cohort studies even if they were not initiated in pregnancy or at birth.
4. Write a white paper on the state of the science of determinants of maternal and child health and the role of Canadian birth cohort studies in contributing to this knowledge base and for knowledge translation into clinical practice and policy. Support "white" paper – identify types of questions/ adding to existing cohorts – needs assessment for next steps
5. Develop a presentation about birth cohort research in Canada with simple messaging that is universal in context. The purpose would be to circulate such a presentation to all members of birth cohort studies for use locally and for MICYRN and other advocacy groups in the

community such as the Canadian Child and Youth Health Coalition to circulate the message of the importance of this area of research to both funders and the general public.

## Communication Plan

1. The first step in communication among existing birth cohort studies was achieved by the workshop as many investigators met each other for the first time and established liaisons and opportunities for collaborations. Information already provided in the Workshop program to all participants included:
  - A summary of the names and acronyms of existing birth cohorts, the principal investigators and study sites in Canada
  - A detailed address and email list of all participants with identifier by acronym of the associated birth cohort study
  - A detailed table of information on each of the existing 16 birth cohort studies including research question, study design, sample size, and all determinant and outcome measurements.
2. Outreach to other cohort studies as they become known was enthusiastically endorsed. Through formal development of the network all cohorts will gain accessibility to protocols and measurement tools. It was suggested that yearly workshops be planned around different themes that will serve to bring the investigators from the cohorts together and advance their collective knowledge on topics of relevance from basic science, clinical and epidemiological perspectives. A website would be a natural means of easy communication and source of documentation.
3. As noted above, the group is keen to produce a white paper on the state of the science of research in early determinants of health in the Canadian context. This would be a group effort. Such a document could serve as an advocacy piece for future fund raising initiatives and for engaging the broader research and health care community in the importance of longitudinal, prospective research on determinants of health and chronic disease.
4. After the CBCRN Workshop was planned and funding secured from MICRYN, we were advised of a meeting being organized for February 9-10, 2009 in Ottawa entitled, ***“Canadian Children’s Environment and Health Workshop”***. It was sponsored collaboratively by the CIHR Institute of Human Development, Child & Youth Health (IHDCYH) and the Office of Vulnerable Populations and the Bureau of Environmental Health Science and Research of Health Canada. Some but not all of the pregnancy/birth cohorts that are part of CBCRN participated in that Workshop, likely because there was a focus on environmental exposures and outcomes. During the Ottawa meeting, members of the CBCRN group present suggested that we expand the CBCRN workshop to include a session on research tools and methodologies so that we could begin the sharing of such items across cohort studies. This was accommodated within the CBCRN meeting. It is planned to keep in contact with Health Canada and IHDCYH

in order to work together on future initiatives of interest in relation to pregnancy/birth cohort studies in Canada.

## APPENDIX I

### PROFILES of GUEST SPEAKERS

#### **Denise Avard, BScN, MA, PhD**

Dr. Denise Avard is the Research Director for the Genetics and Society Project. Her research interests are in the areas of genetic testing and screening relevant to newborn, children, adolescents and persons with disabilities. She has added interest in knowledge transfer and genetic epidemiology. She obtained her doctorate in social epidemiology from the University of Cambridge, England, and a Master's degree in sociology and a Bachelor's degree in Nursing from the University of Ottawa. Prior to joining the CRDP she was Executive Director of the Canadian Institute of Child Health and assistant professor in the Faculty of Medicine University of Calgary.

#### **Anne Junker, MD FRCPC**

Dr. Junker is an Associate Professor, UBC Department of Pediatrics and a clinical immunologist specializing in the genetic immunodeficiency disorders, with research experience establishing mother-infant cohorts for longitudinal studies of host immune-pathogen consequences of early infant infections with herpes group viruses. As Senior Medical Director for Pediatric Medical Specialties at BC Children's Hospital she manages a portfolio that encompasses 25 clinical programs associated with 10 subspecialty divisions in the Department of Pediatrics, with oversight of related inpatient, medical daycare, clinic and office facilities. Principal cross-cutting themes of this portfolio are chronic disease management including adolescent transitioning; and, communication and information systems. As Director for Clinical and Population Research with the Child & Family Research Institute she manages infrastructure including the Clinical Research Support Unit whose staff provide education, methodological, biostatistics and data management advice and services. Dr. Junker has recently accepted the position as Director of MICYRN.

BC Children's is the only tertiary child care facility in the province of 4.5 million, and is an agency of the Provincial Health Services Authority (PHSA). The health care campus includes the BC Women's Hospital, a high risk maternity centre with 8,000 deliveries a year; the BC Child & Youth Mental Health facility; the Child & Family Research Institute; the Women's Health Research Institute; and the BC Mental Health & Addiction Services Research Institute.

#### **Michael Kramer, MD**

Dr. Michael S. Kramer is James McGill Professor in the Departments of Pediatrics and of Epidemiology and Biostatistics at McGill University Faculty of Medicine. He has been a National Health Research Scholar and National Health Research Scientist of Health Canada's National Health Research and Development Program (NHRDP), a Chercheur-boursier senior (senior research scientist) of the Fonds de la recherche en santé du Québec (FRSQ), and a Distinguished Scientist of the Canadian Institutes of Health Research (CIHR). He has been principal investigator on several large, multicentre epidemiologic studies and randomized trials in the general area of maternal and child health. A member of four expert committees of the U.S. Institute of Medicine, in 1997-98 Dr. Kramer served as President of the Society of Pediatric and Perinatal Epidemiologic Research. From 1995-2001, he chaired the Steering Committee of the Canadian Perinatal Surveillance System and until May 2003, chaired the Institute Advisory Board of CIHR's Institute of Human Development and Child and Youth Health (IHDCYH). He currently serves as IHDCYH's Scientific Director. He has received operating grant support from the Medical Research Council (now CIHR) of Canada, NHRDP, NIH, FRSQ, and the March of Dimes.

Dr. Kramer has authored or co-authored 20 books and monographs, and has published nearly 300 original articles. His systematic review of the evidence on the optimal duration of exclusive breastfeeding led

directly to new infant feeding recommendations by WHO and the World Health Assembly. His current principal areas of research are the causes and prevention of preterm birth and intrauterine growth restriction, the determinants of fetal and infant mortality, and the long-term child health effects of breastfeeding.

**Shoo K. Lee, MBBS, FRCPC, FAAP, PhD.**

Dr. Shoo Lee is a neonatologist and health economist. He is a Professor of Paediatrics, Obstetrics and Gynaecology, and Head of the Division of Neonatology at the University of Toronto; Paediatrician-in-Chief and Director of the Maternal-Infant Care (MICare) Research Centre at Mt. Sinai Hospital; and The Women's Auxillary Chair in Neonatology and Head of the Division of Neonatology at the Hospital for Sick Children. He received his medical degree from the University of Singapore, completed paediatric training at the Janeway Children's Hospital in Newfoundland and neonatal fellowship training at Boston's Children's Hospital, and received his PhD in Health Policy (Economics) from Harvard University. He established the Canadian Neonatal Network<sup>TM</sup> and the International Neonatal Collaboration to foster collaborative research and leads the CIHR Team in Maternal-Infant Care. His research focuses on improving quality of care, patient outcomes and health care services delivery. He has received many awards for his work, including the Knowledge Translation Award from the Canadian Institutes of Health Research, the Aventis Pasteur Research Award and the Distinguished Neonatologist Award from the Canadian Paediatric Society, and the Premier Member of Honour Award from the Sociedad Iberoamericana de Neonatologia.

**Steven Lye, PhD**

Dr. Lye is Associate Director of the Samuel Lunenfeld Research Institute of Mount Sinai Hospital and Vice-Chair Research and Professor of Ob/Gyn, University of Toronto. His research is focused on the genetic and molecular mechanisms controlling term and preterm labor, the pathways regulating placental development and gene-environment interactions underlying the developmental origins of health and disease. Dr. Lye has published over 150 peer-reviewed papers and holds research funding from CIHR, CFI and the NH&MRC (Australia), as well as a Canada Research Chair in Maternal, Fetal and Neonatal Health. He is a member of the Scientific Advisory Council of AHFMR. In collaboration with colleagues at the University of Western Australia (and its birth cohort, the Raine Study) Dr. Lye is investigating genetic variants that underlie how an adverse environment during development leads to an increased incidence of adverse outcomes in later life (including obesity, metabolic syndrome and mental disorders).

**Malcolm R Sears, MB, ChB, FRACP, FRCPC, FAAAAI**

Dr. Malcolm Sears received his medical training at the University of Otago, Dunedin, New Zealand where he also undertook five years postgraduate education followed by two years pulmonary fellowship at the University of Washington. He was appointed to the Faculty of the University of Otago, Department of Medicine, and pursued clinical and research interests in the epidemiology and management of asthma. In 1990 he was appointed Professor of Medicine at McMaster University, Hamilton, Ontario, Canada, and Head of Respiriology at St. Joseph's Hospital. He is a Fellow of the Royal Australasian College of Physicians, the Royal College of Physicians and Surgeons of Canada, and the American Academy of Asthma, Allergy and Immunology. In 2002 he was appointed Research Director of the Firestone Institute for Respiratory Health. His major research contributions have been in longitudinal studies of the development and natural history of childhood asthma, investigations of asthma exacerbations and mortality, and studies of the effects of bronchodilators and anti-inflammatory treatments for asthma. He is the Principal Investigator for the Canadian Healthy Infant Longitudinal Development (CHILD) study involving 5000 families recently funded by the Canadian Institutes of Health Research and the AllerGen Network of Centres of Excellence. Publications include 22 book chapters, and over 175 peer-reviewed papers.

## APPENDIX II

### Existing Canadian Birth Cohort Studies & Principal Investigators

Principal Investigator(s)	Name of Study (acronym)	Site(s) of Birth Cohort Study
Tye Arbuckle (Health Canada)  William Fraser (U Montreal)	Maternal-Infant Research on Environmental Chemicals ( <b>MIREC</b> )	Montreal, Hamilton, Toronto, Vancouver, Sudbury, Ottawa, Kingston (Winnipeg, Regina)
Elizabeth Asztalos and Kellie Murphy (U Toronto)	Role of Repeated Antenatal Steroids on Neonatal/Perinatal Morbidity ( <b>MACS and MACS-5</b> )	Toronto
Stephanie Atkinson and Koon Teo (McMaster U)	Family Atherosclerosis Monitoring In Early Life ( <b>FAMILY</b> )	Hamilton/Burlington (Halton region)
Heather Dean, Elizabeth Sellers, Jon McGavock (U Manitoba)	The Next Generation: Offspring of Mothers with Early Onset Type 2 Diabetes ( <b>NextGen</b> )	Winnipeg
Linda Dodds (U Dalhousie)	Early Pregnancy Markers for Pre-eclampsia ( <b>PreMark</b> )	Halifax
Lise Dubois (U Ottawa)	Longitudinal Study of Child Development in Quebec ( <b>LSCDQ</b> )	Quebec
Bonnie Kaplan (U Calgary) Catherine Field, (U Alberta)	Alberta Pregnancy Outcomes and Nutrition ( <b>APrON</b> )	Edmonton and Calgary
William Fraser (U Montreal)	Integrated Research Network in Perinatology of Quebec & Eastern Ontario ( <b>IRNPQEO</b> )	P Quebec & Eastern Ontario
Jill Hamilton, Ravi Retnakaran, Anthony Hanley (U Toronto)	Insulin Resistance and Beta Cell Dysfunction in Early Childhood: The Role of Maternal and Infant Metabolic Risk Factors	Toronto
Michelle Mottola (UWO)	Nutrition & Exercise Lifestyle Intervention Program ( <b>NELIP</b> )	London

<b>Principal Investigator(s)</b>	<b>Name of Study (acronym)</b>	<b>Site(s) of Birth Cohort Study</b>
Bertrand Perron and Michel Boivin (U Laval)	Étude longitudinale du développement des enfants du Québec <b>(LSCDQ-ELDEQ)</b>	Quebec
Alan Rosenberg (U Saskatchewan)	Role of intra-uterine inflammation as a determinant of future disease <b>(PreDICTR Study)</b>	Saskatoon
Malcolm Sears (McMaster) PJ Subbaro (U Toronto)	Canadian Healthy Infant Longitudinal Development ( <b>CHILD</b> ) Study	Edmonton, Vancouver, Winnipeg, Toronto  Coordinating Centre – Hamilton
Garry Shen (U Manitoba)	Impact of exercise and nutrition on excessive GWG, GDM, macrosomia and child growth ( <b>IDEA</b> )	Winnipeg
Suzanne Tough (U Calgary)	All Our Babies Cohort ( <b>AOB</b> )	Calgary
Mark Walker & Shi-Wu Wen (U Ottawa)  Marc Roger & Graeme Smith (Queen's U)	Ottawa and Kingston ( <b>OaK</b> ) Birth Cohort Study	Ottawa/Kingston

## **APPENDIX III**

### **Canadian Birth Cohort Research Network**

#### **Summary of Workshop Ethical Issues**

Prepared by Denise Avard

The various presentations regarding the implementation of longitudinal studies raised a number of ethical issues including: consent at various stages of the project; return of research results; protections of privacy; ethical review process; linking of various databases; and consideration of vulnerable population, such as Aboriginal communities.

#### **1) CONSENT TO RESEARCH**

The amount and complexity of the information that is given to participants varies tremendously. Also, the consent process and amount of time differ between projects. Many researchers have developed models to address the information that has to be processed including: banking, volume of information to share, etc.

##### **Actions:**

- RERA committee will contact each leader of a paediatric longitudinal cohort study to obtain copies of their consent forms;
- The forms will be reviewed for various issues and will be collected as an important resource for the CBCRN. Also this inventory will enable a comparison of strengths awakening and form the basis for recommendations;
- The consent forms will be anonymized;
- The consent forms should be sent directly to Julie Samuël, Project Manager at the CRDP, who will be in charge of the analysis of the consent forms, at: [julie.samuel@umontreal.ca](mailto:julie.samuel@umontreal.ca).
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#### **2) CONSENT/ASSENT**

When parents enroll in a birth cohort or a paediatric study they are consenting to their child's participation. This is acceptable because the infant/child does not have the capacity to consent. As time passes and the children age, they gradually develop the ability of decide for themselves whether they wish to participate in the research. This takes the form of an assent. The preparation of assent forms is highly complex and researchers are seeking for directions on how to proceed. Also there is a need to address how to go about recruiting children when they reach an age of assent.

##### **Actions:**

RERA committee will collect from each research team in the CBCRN examples of assent forms;

- This will be reviewed and a paper would be prepared to summarize. The grouping together of assent models for longitudinal studies will be a valuable asset to the CBCRN;
- The assent forms will be anonymized;

The consent forms should be sent directly to Julie Samuël, Project Manager at the CRDP, who will be in charge of the analysis of the consent forms, at: [julie.samuel@umontreal.ca](mailto:julie.samuel@umontreal.ca).

### 3) ETHICS REVIEW PROCESS

The application for ethics review and satisfying REB approval raised many concerns for the researchers and their wish for alternative review models. It was noted that the *Draft 2<sup>nd</sup> Edition of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Human* is circulating for comments and that various researchers involved in longitudinal studies should consider submitting a brief.

#### **Actions:**

- The PDF of the *Draft 2<sup>nd</sup> Edition of the Tri-Council Policy Statement* will be circulated to the members of the CBCRN. Chapter 8 (pp. 81-90) reviews mechanisms for research involving multiple institutions and research ethics boards;
- An electronic version of the Draft is available online at: <http://www.pre.ethics.gc.ca/policy-politique/docs/TCPS-Draft2-eng.pdf>.

### 4) SECONDARY USE

In addition to the above, the Secondary Use of Personal Information for Research Purposes was raised as a concern. It was noted that identifiable information (e.g. date of birth) is critical information in longitudinal studies and in birth cohort studies. Anonymizing the samples is not helpful. The grouping together of research databanks and cohorts to create large databank raises specific issues with regard to the protection of privacy. Some questions that were raised, such as did the consent process address the issues of sharing data, linking data with other researchers, with other databases?

#### **Action:**

- In collaboration with NCEHR, the CRDP is developing a document on *Best Practices for Research Involving Children and Adolescents*. This document will address specific issues related to paediatric longitudinal studies. The final Draft of this document will be circulated to CBCRN during the summer.

### 5) BIOBANKS

When researchers want to combine cohorts to conduct research on an issue other than the original research question or to combine cohorts to increase sample size/and/or statistical power.

**Actions:**

- The GenEdit “Biobanks and Longitudinal Studies: Where Are the Children?” is available online at: <http://www.humgen.umontreal.ca/int/GE/en/2008-3.pdf>;
- The members may also consult our HUMGEN modules on paediatric research and on population genetics to find norms and relevant literature:
  - PediaGen at <http://www.pediagen.org>;
  - PopGen at <http://www.popgen.info>.