McGill

Department of Epidemiology, Biostatistics & Occupational Health

Biostatistics Seminars

Fall 2013

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Empirical kinship estimation in the French Canadian founder population

Tuesday, October 15th, 2013
3:30 pm – 4:30 pm
Purvis Hall, 1020 Pine Ave. West, Room 25

ALL ARE WELCOME

Abstract:

Several identity-by-descent (IBD) estimation methods have recently been developed, taking advantage of high-density genotype data. Most are designed for outbred populations and unilineal relationships. In founder populations like the French Canadian (FC) population of Quebec (Canada), any 2 individuals likely share many common ancestors. We examined the impact of including IBD shared at more than 2 alleles in a pair of individuals on kinship estimation in the FC founder population. We used genotype data from Illumina HumanHap650Y arrays and genealogical data from the BALSAC population register on 140 individuals from 7 sub-populations of Quebec. We used the IBDLD software, which allows estimation of all nine condensed identity states. We also used GERMLINE and Beagle Refined IBD. We compared empirical to genealogical kinship estimates using intraclass correlation coefficients (ICC) and correlated IBD estimates to genealogical characteristics including number of and distance to ancestors. Using IBDLD, we found that individuals shared more than 2 alleles IBD on 0.002 to 0.06% of their genomes on average (up to 2.7%) depending on the sub-population. We found high ICCs (0.74-0.87) between empirical and expected kinship in the sub-populations with higher levels of relatedness. IBD sharing at more than 2 alleles did not improve the ICCs but was significantly associated with genealogical characteristics, and could thus provide information on relatedness in founder populations.

Bio:

Dr. Roy-Gagnon holds a Ph.D. in Genetic Epidemiology from the Johns Hopkins Bloomberg School of Public Health combined with a M.Sc. in Statistics from Laval University. She also acquired postdoctoral training in Statistical Genetics at the National Human Genome Research Institute of the NIH and at the University of Michigan. After five years as an Assistant Research Professor at University of Montreal, she joined the Department of Epidemiology and Community Medicine at the University of Ottawa in July 2013. The overall goal of Dr. Roy-Gagnon's research is to optimize the utilization of existing study designs and analytical methods and to develop new methodological approaches for genetic epidemiological studies of complex diseases. Dr. Roy-Gagnon's research is divided into two parts: methodological developments and applications through multidisciplinary collaborations, including studies on cancer and cardiovascular risk factors and in population genetics.