University of Victoria | Graduate Studies

Notice of the Final Oral Examination for the Degree of Master of Science

of

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BSc (University of Victoria, 2010)

"Geographic Exposure and Risk Assessment for Food Contaminants in Canada"

Department of Geography

Tuesday, June 14, 2016
10:00AM
David Turpin Building
Room B215

Supervisory Committee:
Dr. Peter Keller, Department of Geography, University of Victoria (Supervisor)
Dr. Aleck Ostry, Department of Geography, UVic (Member)
Dr. Eleanor Setton, Department of Geography, UVic (Additional Member)

External Examiner:
Dr. Michael Hayes, School of Public Health and Social Policy, UVic

Chair of Oral Examination:
Dr. Cedric Littlewood, Department of Greek and Roman Studies, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

The purpose of this thesis is to explore differences in lifetime excess cancer risk (LECR) for Canadians from intake of contaminants in food and beverages based on geographic location, gender and income levels. A probabilistic risk assessment approach (Monte Carlo simulation) was used to estimate the range and frequency of possible daily contaminant intakes for Canadians, and associate these intake levels with lifetime excess cancer risk. Monte Carlo risk simulation was applied to estimate probable contaminant intake and associated lifetime excess cancer risk from arsenic, benzene, lead, polychlorinated biphenyls (PCBs) and tetrachloroethylene (PERC) estimated in 60 whole foods for dietary patterns of 34,944 Canadians from 10 provinces, as derived from Health Canada's Canadian Community Health Survey, Cycle 2.2, Nutrition (2004)1. These results were compared to the current Health Canada guideline that suggests that 10 extra cancers per one million people is a negligible risk. Of the 5 contaminants tested in my model arsenic showed the greatest difference between urban and rural estimated lifetime excess cancer risk, although extra cancers in both rural and urban Canada were predicted from exposure to PCB and benzene. Lifetime excess cancer risk is estimated to be higher for men in Canada for all five contaminants, with an emphasis to males in British Columbia compared to females from the dietary intake of arsenic. When based on income level, my model predicts extra cancers higher for low and middle incomes from dietary exposures to arsenic, benzene, lead and PERC, however, high income populations are more likely to have extra cancers from dietary intake of PCBs.