



McGill

Department of  
Epidemiology, Biostatistics  
and Occupational Health

## Biostatistics Seminars

Winter 2019



### **Eva Suarathana, MD, MSc, PhD**

Assistant Professor, Dept. of Social and Preventive Medicine,  
School of Public Health, Université de Montréal & Adjunct  
Professor, McGill University

## When Population Gets in the Way: A Lesson in Generalization of Canadian Prediction Models for Occupational Asthma in European Countries

**Tuesday, February 12, 2019 - 3:30-4:30 pm**  
**Purvis Hall, 1020 Pine Ave. West, Room 24 - All are Welcome**

### **Abstract**

**OBJECTIVE:** Specific inhalation challenge (SIC) as the reference test for occupational asthma (OA) is only available in a few centres worldwide. Diagnostic models of OA induced by high-molecular-weight agents (HMW-induced OA) were developed in Canadian population with good accuracy and internal validity. We aimed to evaluate the generalizability of these models in European data.

**METHODS:** OA was defined as positive SIC. Analysis was restricted to workers exposed to HMW agents, who still worked one month before SIC. We used databases from Belgium (n=164), Finland (n=112), Poland (n=156), Spain (n=41) (total=473 subjects in all European data). Model-1 included age, agent type, the presence of rhinoconjunctivitis, and inhaled corticosteroid use. Model-2 included Model-1 items, sensitization to occupational agents, and non-specific bronchial hyperresponsiveness. The accuracy (discriminative ability and calibration) of both models were evaluated in all European and country-specific data using different statistical methods.

**RESULTS:** Except in Poland, the associations between the predictors and OA as well as the diagnostic values of the objective tests in data from the individual European populations (validation sets) differed from Canadian data (development set). When all European data were merged, these differences disappeared and this explained why the models performed with good accuracy without any adjustment in Poland and merged European data, but not in the other country-specific populations. The area under the receiver operating characteristics curves (AUC) of Model-1 was 0.75, 0.76, and 0.66, while the AUC of Model-2 was 0.89, 0.92, and 0.83 in Canadian, Poland, and all European data, respectively.

**CONCLUSION:** We validated the models with high accuracy. However, there were marked between-population discordances in model performance, which justifies population-specific models rather than incorrectly using one general model.

### **Bio**

**Eva Suarathana, MD, MSc, PhD** is an Assistant Professor in the Department of Social and Preventive Medicine at the School of Public Health, Université de Montréal. She graduated from the Faculty of Medicine, University of Indonesia in Jakarta in 2001. Her interest in the prediction studies began during her master's studies in Clinical Epidemiology at the Netherlands Institute for Health Sciences in Rotterdam, the Netherlands. She continued her doctoral program with a thesis on "Predicting occupational lung diseases" at the Institute for Risk Assessment Sciences, University of Utrecht. For her doctoral project, she developed diagnostic model for detection of sensitization to wheat allergens that has been utilized as a surveillance screening tool among Dutch bakers. She was among the few international health professionals selected to join the Epidemic Intelligence Service (EIS) Program within the Centers for Disease Control and Prevention (CDC), Atlanta, USA. She had a 2-year assignment at the National Institute for Occupational Safety and Health (NIOSH), Division of Respiratory Disease Studies in Morgantown, West Virginia, U.S. Since January 2012, she has been working as a full-time researcher in the Chronic Disease division at the Hôpital du Sacré-Coeur de Montréal Research Center. Dr. Suarathana is a recipient of the Career Award (Junior 1) FRQ - IRSST in Health and Workplace Safety. In 2018 she was appointed as an Adjunct Professor in the Department of Obstetrics and Gynecology, McGill University. Publications: [Google Scholar Suarathana](#)

[www.mcgill.ca/epi-biostat-occh/news-events/seminars/biostatistics](http://www.mcgill.ca/epi-biostat-occh/news-events/seminars/biostatistics)