

## ABSTRACT SUBMISSION FORM

LET'S TALK ABOUT

# SEX + GENDER

Exploring the role of sex and gender on health research



## CHR D 2020: Abstract Submission Form

### Submitter Name

Azizur Rahman

### Email

rahmana1@myumanitoba.ca

### Title

Machine Learning Methods and Latent Class Analysis for the Predictive of Early Child Development

### Background

The early years of children's lives are very important for future success in school and life. The Early Development Instrument (EDI) is a valid and reliable assessment of children's age appropriate development across five domains: physical, emotional, social competence, language and cognitive skills and communication skills with sixteen subdomains.

### Objective

Our objective was to investigate how machine learning methods (ML) and latent class analysis (LCA) can help us to identify the patterns of children's scores on the EDI.

### Methods

In Manitoba, biennially, Kindergarten teachers complete EDI assessments for children in their classroom. A sample of 8194 children from the 2010-2011 academic year were randomly divided into a training set (N=5463) and test set (N=2731). The mean scores on sixteen subdomains from EDI questionnaire were used as indicators of ML and LCA analyses. Five ML algorithms: K-means, K-medoids, K-mode, Hierarchical and Spectral were compared using the silhouettes coefficients.

### Results

K-means clustering algorithm among all other ML clustering methods performed best based on silhouettes coefficients (0.183). Four different patterns of EDI were identified. There were some differences between ML and LCA in prevalence rates of each pattern.

### Conclusion

K-means and ML algorithm provided results that were highly compatible with LCA, being capable of automated identification of priority group of children in among Early Development Instrument scores that can influence in communities and public policies. In terms of needs and accessibility of mental and

physical services.

**Theme:**

Community Health / Policy

**Do you have a table/figure to upload?**

No

**Are you willing to participate in Goodbear's Den?**

Yes

**Presenter Status:**

PhD Student

**What was your role in the project?**

Analyze Data

## Authors

Name	Email	Role	Profession
Azizur Rahman	rahmana1@myumanitoba.ca	Presenting Author	
Depeng Jiang	Depeng.Jiang@umanitoba.ca	Co Author	Associate Professor
Monica Novotny	Monica.Novotny@gov.mb.ca	Co Author	
Teresa Mayer	Teresa.Mayer@gov.mb.ca	Co Author	