TUFH 2020 Abstracts

Title	**Using Agent Based Model (ABM) and AI to Solve Complex Health Problems: Implications for Future Health Workforce**
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Presenting Author	**Akiko Maeda**
Co-Authors	**Rabia Khan**
Country	Canada
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Content	Health problems are complex because they involve multiple actors and interactions whose outcomes are not easily predictable using traditional research methods. Recent advancements in computing capacity, including application of machine learning and pattern recognition through artificial intelligence (AI) is enhancing public health surveillance and beginning to assist in healthcare management and decision making at multiple levels. Availability of Big Data and social media have made it feasible to design models, such as Agent Based Modelling (ABM) to simulate complex problems. Our presentation reviews how to apply ABM and AI to inform policy design and improve population wellness and quality of care without adding to costs using anti-vaccination response to immunization as a model. Methods: We conducted a literature review of ABM and AI application in health and propose a framework for designing research to inform decision-making in addressing complex health problems. We apply the framework on measles vaccination coverage by combining epidemiological model of disease control through vaccination and behavioural response model predicting reactions of families to anti-vaccination information from social influencer and pro-vaccine information from public health officials. We highlight where ABM and AI could be applied in the model design. Results: The framework allows investigators to analyse complex health problems using ABM and AI to predict the impact of social interactions among population on vaccination rates and spread of disease. Conclusion: We propose a research framework using ABM to solve complex health problems and discuss implications on skills requirement of future health workforce.