

# AiPHA Distinguished Lecture Series



## Professor Seyed Moghadas York University

### Title: Containment Scenarios for Post-Spillover H5N1 Transmission Chains

**Date:** Tuesday, March 17, 2026

**Time:** 12:00 - 1:00 PM

**Location:** LIAM Lab, Room 227, Kinsmen Building

**Abstract:** Avian influenza H5N1 continues to expand across species and geographic regions, sustaining concern about the risk of human adaptation following spillover. In this talk, I will present an agent-based modelling study parameterised to a high-risk poultry-farming region in Canada, examining early containment strategies after a spillover infection. Simulations were initiated with low, subcritical transmissibility ( $R_0 = 0.2$ ) but allowed for within-host adaptive mutations that incrementally increase transmissibility during the course of disease. Despite  $R_0 < 1$ , multi-generation transmission chains can occur, creating opportunities for beneficial mutations. We show that prompt self-isolation of symptomatic cases, particularly with high compliance, substantially reduces the probability and duration of these chains and lowers cumulative infections. Targeted vaccination of poultry farmers and their households provides additional benefit when protection is established before spillover, whereas delayed reactive vaccination has limited impact under realistic rollout timelines. These findings highlight how rapid detection, early behavioural response, and targeted immunisation can reduce both near-term transmission and longer-term evolutionary risk following H5N1 spillover events.

### **Dr. Seyed Moghadas's Short Bio:**

Seyed Moghadas is Professor of Computational Epidemiology and Vaccine Science, internationally recognized for his foundational contributions to infectious disease modelling, agent-based simulation, and public health policy evaluation. His work focuses on vaccination strategies, outbreak response, and pandemic preparedness, integrating mechanistic modelling, optimization, and AI-driven approaches to inform real-world decision-making. He is the Founding Director of the Agent-Based Modelling Laboratory and the Inaugural Scientific Director of the Centre of Excellence in Artificial Intelligence for Public Health Advancement, leading integrated research programs at the interface of modelling, artificial intelligence, and precision public health. Dr. Moghadas's research spans vaccine effectiveness and cost-effectiveness analysis, optimal allocation of limited health resources, behavioural responses to interventions, multi-strain and waning-immunity dynamics, as well as preparedness strategies for emerging and re-emerging infectious diseases. His work has had global policy impact on the control of COVID-19, influenza, measles, meningococcal disease, RSV, and other infectious threats. He is the recipient of York University's President's Research Impact Award and has authored over 200 peer-reviewed publications in leading scientific journals.