

# SEMINARIO ALEATORIO

## 451

### BAYESIAN MIXTURE BEHAVIORAL CHANGE MODELS FOR EPIDEMICS

#### RESUMEN:

Traditional epidemiological models frequently assume behavioral homogeneity. However, empirical populations represent a complex mosaic of risk tolerance. While the susceptible-infected-recovered model provides a robust foundation for characterizing disease transmission, and behavioral change models offer mechanisms for capturing dynamic responses to outbreaks, both frameworks often overlook the inherent heterogeneity within a population. This paper introduces a novel Bayesian mixture model designed to address this limitation by partitioning the population into two distinct behavioral archetypes: risk-neutral individuals, who maintain baseline contact rates, and risk-averse individuals, who modulate their behavior in response to epidemic severity. By integrating these disparate dynamics into a unified transmission framework, the proposed model explicitly accounts for the social friction often neglected by aggregate approaches. Through both simulation studies and empirical data applications, we demonstrate that this mixture approach significantly outperforms traditional models in parameter recovery, epidemic trajectory estimation, and forecasting precision. Our findings indicate that failing to account for behavioral diversity results in biased peak estimates and artificially elongated epidemic curves. Consequently, this research provides a more nuanced computational toolkit for predicting outbreak trajectories in socially fragmented environments, ensuring that public health intervention strategies are informed by a foundation of behavioral realism.

Presentado por



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#### Detalles del evento:

 **Fecha:** Viernes 13 de marzo, 2026

 **Hora:** 13:00 (Hora Centro de México)

 **Ubicación:** salón SA-2, ITAM  
Campus Río Hondo