



Departmental Colloquium

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September 16th, 2026, Knott Hall B01 3:00 PM

Zoom link : <https://loyola.zoom.us/j/81031149427>

Meeting ID: Meeting ID: 810 3114 9427

Passcode: mathstat

Hierarchical ARIMAX Modeling in South Korea's Public Health Policy and Media Frames



Abstract

This study develops a hierarchical ARIMAX framework to characterize the dynamic relationship between the legislature's public health policymaking and the media's news framing in South Korea. Monthly counts of drug-related bills proposed in the Korean National Assembly (2013–2023) are modeled as an ARIMA process with four exogenous framing series: episodic, thematic, criminal-justice, and public-health news articles, treated as structured external inputs. Granger-causality tests evaluate whether temporal changes in each framing series precede shifts in legislative activity, providing an identification strategy grounded in predictive precedence. The hierarchical decomposition models each exogenous series with separate autoregressive structures and innovative outliers, enabling detection of abrupt shocks and other temporal irregularities in media framing. Together, these components show how the form and evolution of external information can be systematically incorporated into a unified time-series system, offering a generalizable statistical framework for analyzing media-driven policy processes.

Keywords: Time series analysis, Hierarchical ARIMAX modeling, Media framing, Public health policymaking, Health communication

Refreshments will be served.

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