

# Digital Epidemiology and Pathogen Genomics Workshop

**22 September 2023, 1- 5pm (AEST)**

Lecture Theatre 4, Westmead Education & Conference Centre, Level 2, Westmead Hospital

This **face-to-face** workshop will showcase research in digital epidemiology and pathogen genomics by the Centre for Complex Systems, The University of Sydney in collaboration with the Centre for Infectious Diseases and Microbiology – Public Health, Westmead Hospital. Researchers and public health professionals with an interest in infectious disease research are invited to two sessions of presentations by the research team followed by moderated discussions on the role of disease modelling in informing public health response to infectious diseases.

**Session 1** will discuss a complex systems' modelling approach to foodborne disease epidemics using examples from non-typhoidal *Salmonella* epidemiology in NSW. Presenters will report a method to explore the evolutionary dynamics of *Salmonella* using networks based on these genomic data. This approach identifies putative evolutionary pathways and the emergence of strains that pose a potential risk to public health.

**Session 2** will focus on an agent-based model that was used during the COVID-19 pandemic to explore the impact of vaccination and several non-pharmaceutical interventions (NPIs) on the progression of the pandemic in Australia. The model predicts how the disease burden responds under scenarios with different levels of compliance with NPIs such as social distancing. It was then used to demonstrate that a socially acceptable balance between health effects and incurred economic costs is achievable over the long term.

## Program

13.00	<b>Welcome and Introductions</b> Prof Vitali Sintchenko and Prof Mikhail Prokopenko
<b>SESSION 1: SALMONELLA EVOLUTIONARY DYNAMICS</b> Chair: Prof Vitali Sintchenko	
13.10	<b>Evolutionary pathways and genotype networks of foodborne pathogens</b> , Prof Mikhail Prokopenko
13.30	<b>Exploration and exploitation: Genome entropy and network centrality delineate pathogen evolution</b> , Dr Sheryl Chang
13.50	<b>Pangenome analysis of a <i>Salmonella</i> Enteritidis population</b> , Dr Carl Suster
14.10	Moderated discussion
14.50	Afternoon tea break
<b>SESSION 2: PANDEMIC MODELLING</b> Chair: Dr Rebecca Rockett	
15.20	<b>Agent-based modelling of the COVID-19 pandemic: tipping points and amplification effects</b> , Prof Mikhail Prokopenko
15.40	<b>Modelling recurrent waves of the COVID-19 pandemic: The impact of fluctuating social distancing</b> , Dr Sheryl Chang
16.00	<b>Optimising cost-effectiveness of pandemic response under partial intervention measures</b> , Dr Quang Nguyen
16.20	Moderated discussion
17.00	CLOSE

**REGISTRATION:** <https://digitalepiworkshop.eventbrite.com.au>

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