Dong Wang

Postdoctoral Fellow with a Ph.D. in **Mathematics** and expertise in **mathematical modeling**, **statistical inference**, and **complex network** analysis. Experienced in integrating **epidemiological**, **genomic, environmental** and **human mobility** data to improve infectious disease surveillance and forecasting. Passionate about applying quantitative methods to real-world public health challenges and contributing to operational decision-making.

Gender: Male

Address: 106, 1/F, Patrick Manson Building (North Wing),7 Sassoon Road, Pokfulam, Hong Kong

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Present academic position:

Post-doctoral Fellow   School of Public Health   The University of Hong Kong

https://sph.hku.hk/en/Biography/Wang-Dong

Educations

2016–2021	Ph.D. of Science
	Major: Mathematics
	School: School of Science
	Institution: Harbin Institute of Technology, Shenzhen, China
2015–2016	Master stage (MD-PhD based program)
	Institution: Harbin Institute of Technology, Shenzhen, China
2011–2015	Bachelor of Science
	Major: Information and Computing Science
	School: School of Mathematics and Computer Science
	Institution: Northwest Minzu University, Lanzhou, China

Skills

Epidemiology; Mathematical and statistical modeling; Complex network and spatial-temporal analysis; Bayesian hierarchical modeling; Genomic epidemiology; Forecasting infectious diseases; Analysis of collective behavior.

Particularly adept at higher-order infectious disease modeling that synthesizes epidemiological, geographic, phylogenetic, and network approaches to elucidate the impact of viral evolution and human mobility on shaping patterns of disease transmission.

Interests

Quantitative high-order modeling of infectious disease transmission, with particular emphasis on the integration of multiple data streams, including epidemiological, genomic datasets, human mobility, environmental, and non-pharmaceutical intervention etc, to improve our understanding and prediction of infectious disease dynamics, and to inform the development of more effective spatial/global disease control strategies. Interested in developing and applying complex models to

real-world public health problems, including forecasting infectious diseases and optimizing surveillance strategies.

Softwares

Extensive experience with **R**, including data visualization (*ggplot2*), bioinformatics workflows, and, in particular, mathematical modeling and statistical inference via **RStan**. Proficient in **Python** for data manipulation and analysis (pandas and others), as well as **MATLAB** for numerical computations and algorithmic development.

Project

Reference number	Project title	Capacity (PI / Co-I)	Funding source(s) and amount
22210582	The impact of higher-order interactions in human mobility networks on the transmission of COVID-19 in Hong Kong and mainland China	PI	Health and Medical Research Fund (HMRF) HK$551,440.00
17100225	Identifying the dynamical interaction among respiratory viruses including influenza and COVID-19, and prediction of their cocirculation burden in the post-pandemic period using multi-stream data	Co-I	General Research Fund (GRF) HK$1,015,417

Publishing

[1] **Dong Wang**, Yiu-Chung Lau, Songwei Shan, Dongxuan Chen, et al Ensemble forecasting of influenza activity and dynamical characteristics during and post-COVID-19 pandemic era in subtropical location, under review, PLOS Computational Biology 2025.

[2] **Dong Wang** *et al.* Social reinforcements and the spatiotemporal characteristics for the transmission dynamics of SARS-CoV-2 in mainland China (Completed; manuscript to be submitted to Science), 2025.

Publications

[1] D. Chen, D.C. Adam, YC Lau, **Dong Wang** *et al.* Investigating setting-specific superspreading potential and generation intervals of COVID-19 in Hong Kong. *Nat Commun* **16**, 5816 (2025).

[2] YC Lau, S Shan, **Dong Wang** et al. (2024) Forecasting of influenza activity and associated hospital admission burden and estimating the impact of COVID-19 pandemic on 2019/20 winter season in Hong Kong. *PLOS Computational Biology* 20(7): e1012311.

[3] **Dong Wang**, Yi Zhao, Jianfeng Luo, Hui Leng, Simplicial SIRS epidemic models with nonlinear incidence rates, *Chaos,* 31(5), 053112 2021.

[4] **Dong Wang**, Michael Small, Yi Zhao, Exploring the optimal network topology for spreading dynamics, *Physica A*, 564, 125535, 2021.

[5] **Dong Wang**, Yi Zhao, Hui Leng, Michael Small. A social communication model based on simplicial complexes, *Physics Letters A*, 384 (35), 126895, 2020.

[6] **Dong Wang**, Yi Zhao, Hui Leng, Dynamics of epidemic spreading in the group-based multilayer networks, *Mathematics*, 8(11), 1895, 2020.

[7] **Dong Wang**, Yi Zhao, Network community detection from the perspective of time series, *Physica A*, 522, 205-214, 2019.

Conference

1. Forecasting of influenza activity using multi-stream surveillance data in Hong Kong (Oral). OPTIONS XI, *UK (2022)*

2. Forecasting global influenza activities using multi-stream surveillance data (Poster). EPIDEMIC 9, *Italy (2023)*

3. Prediction of influenza hospital admission rates across age groups in Hong Kong using multi-stream surveillance data (Poster). OPTIONS XII, *Australia (2024)*

4. The COVID-19 transmission dynamics in mainland China: a higher-order spatiotemporal modeling study (Poster).OPTIONS XII, *Australia (2024)*

5. Social reinforcements and the spatiotemporal characteristics for the transmission dynamics of SARS-CoV-2 in mainland China (Oral), EPIDEMIC 10 USA (2025 upcomming)

6. Disentangling the multifaceted drivers of disease transmission: a bayesian hierarchical model of climate, air quality, and contact patterns in Hong Kong (Poster), EPIDEMIC 10 USA (2025 upcomming)

Contact information for reference

Prof. Cowling, Benjamin John	*bcowling@hku.hk*
Prof. Ali Sheikh Taslim	*alist15@hku.hk*

Highly motivated to contribute to projects that integrate **epidemiology**, and **mathematical/statistical modelling** to support public health decision-making.