Qianying Lin, *postdoc*, *Los Alamos National Laboratory*

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Research Interests

Infectious disease modeling, phylodynamics/phylogenetics, bioinformatics, epidemiological stochastic processes, within-host viral-phylo dynamics, and policy-related control strategies for emerging infectious diseases.

Academic

Postdoctoral Research Associate *Los Alamos National Laboratory* *Apr 2022—Apr 2025*
Mentors: Ethan Romero-Severson, Thomas Leitner, Carmen Molina-París
Project: Novel phylogenetic methods for Crimean-Congo hemorrhagic fever virus, implications of viral reassortment

Data Science Fellow *University of Michigan, Ann Arbor* *Oct 2019—Apr 2022*
Mentors: Aaron King, Edward Ionides
Project: A unified framework for phylodynamic inference

Ph.D. Applied Mathematics *Hong Kong Polytechnic University* *Dec 2016—Aug 2019*
Supervisor: Daihai He
Dissertation: Modelling and Statistical Inference for Infectious Diseases

M.Phil. Applied Mathematics *Hong Kong Polytechnic University* *Jul 2015—Nov 2016*

B.Sc. Information and Computing Science *Zhongnan University of Economics and Law* *Sep 2010—Jul 2014*

Publications

Phylodynamics, phylogenetics, and bioinformatics

1. Lin Q, Elaldi N, Vatansever Z, Yildiz B, Hewson R, López-García M, Lythe G, Leitner T, Molina-París CM. (2024) *Identification of Crimean–Congo haemorrhagic fever virus reassortants in Sivas, Turkey.* In progress.
2. Lin Q, Romero-Severson EO, Vatansever Z, Elaldi N, Leitner T, Molina-París CM. (2024) *Within-host genetic variation and evolutionary dynamics of Crimean-Congo hemorrhagic fever virus in Turkey.* In progress.
3. Lin Q†, Romero-Severson EO†, Leitner T. (2024) *Model-based deep learning approach for genomic reassortment inference.* In progress.
4. King AA, Lin Q, Ionides EL. (2024) *Exact phylodynamic likelihood via structured Markov Genealogy Processes.* abs/2405.17032.
5. Lin Q†, Goldberg EE, Leitner T, Molina-París CM, King AA, Romero-Severson EO†. (2024) *The number and pattern of viral genomic reassortments are not necessarily identifiable from segment trees.* Mol Biol Evol. msae078. 10.1093/molbev/msae078.
6. King AA, Lin Q, Ionides EL. (2022) *Markov Genealogy Processes.* Theor Popul Biol. 143. 77--91. 10.1016/j.tpb.2021.11.003.
7. King AA, Lin Q, Ionides EL. (2020) *The Sampled Moran Genealogy Process.* abs/2002.11184.

Mathematical and statistical modeling and inference for infectious disease epidemiology

1. Bellucini G, Lin Q, Williams B, Lou Y, Vatansever Z, López-García M, Lythe G, Leitner T, Romero-Severson EO, Molina-París C. (2024) *Mathematical considerations of the invasion reproduction number in tick-borne virus co-infections.* abs/2403.15282. Submitted to J Theor Biol.
2. He D, Zhao S, Lin Q, Musa SS, Stone L. (2020) *New estimates of the Zika virus epidemic attack rate in Northeastern Brazil from 2015 to 2016: A modelling analysis based on Guillain-Barré Syndrome (GBS) surveillance data.* PLOS Neglect Trop D. 14(4):e0007502. 10.1371/journal.pntd.0007502.
3. Musa SS, Zhao S, Gao D, Lin Q, Chowell G, He D.(2020) *Mechanistic modelling of the large-scale Lassa fever epidemics in Nigeria from 2016 to 2019.* J Theor Biol. 493: 110209. 10.1016/j.jtbi.2020.110209.
4. Lin Q, Chiu APY, Zhao S, He D. (2018) *Modeling the spread of Middle East respiratory syndrome coronavirus in Saudi Arabia.* Stat Methods Med Res. 27(7):1968--1978. 10.1177/0962280217746442.
5. Tang X, Fang S, Chiu APY, Lin Q, Tang E, Wang X, He D.(2018) *Unsynchronized influenza epidemics between two neighboring subtropical cities.* Int J Infect Dis. 69: 85--87. 10.1016/j.ijid.2018.02.019.
6. Zhao S, Lin Q, He D, Stone L.(2018) *Meningitis Epidemics Shift in sub-Saharan Belt.* Int J Infect Dis. 68: 79--82. 10.1016/j.ijid.2018.01.020.
7. Yang S, Chiu APY, Lin Q, Zeng Z, Li Y, Zhang Y, Yang Z, Yang L, He D.(2018) *HIV Epidemics in Chongqing and Shenzhen, China.* PLOS ONE. 13(2): e0192849. 10.1371/journal.pone.0192849.
8. Chiu APY, Lin Q, Tang E, He D.(2018) *Anti-phase Synchronization of Influenza A/H1N1 and A/H3N2 in Hong Kong and Countries in the North Temperate Zone.* Int J Infect Dis. 66: 42. 10.1016/j.ijid.2017.11.006.
9. Chiu APY, Lin Q, He D.(2017) *News Trends and Web Search Query of HIV/AIDS in Hong Kong.* PLOS ONE. 12(9): e0185004. 10.1371/journal.pone.0185004.

† correspondence

10. He D, Chiu APY, Lin Q, Yu D.(2017) *Spatio-temporal patterns of proportions of influenza B cases.* Sci Rep. 7: 40085. 10.1038/srep40085.
11. Chiu APY, Lin Q, He D. (2017). *Religious Festivals and Influenza.* abs/1710.09689.
12. Lin Q, Lin Z, Chiu APY, He D.(2016) *Seasonality of Influenza A(H7N9) Virus in China - Fitting Simple Epidemic Models to Human Cases.* PLOS ONE, 11(3): e0151333. 10.1371/journal.pone.0151333.
13. He D, Chiu APY, Lin Q, Cowling B.(2016) *Differences in the seasonality of MERS-CoV and influenza in the Middle East.* Int J Infect Dis. 40: 15--16. 10.1016/j.ijid.2015.09.012.

Policy-relevant issues

1. Goldberg EE, Lin Q, Romero-Severson EO, Ke R. (2023) *Swift and extensive Omicron outbreak in China after sudden exit from 'zero-COVID' policy.* Nat Commun. 14. 3888. 10.1038/s41467-023-39638-4.
2. Lin Q, Shrestha S, Zhao S, Chiu APY, Liu Y, Yu C, Tao N, Li Y, Shao Y, He D, Li H. (2022) *Changing epidemiology of TB in Shandong, China driven by demographic changes.* Front Med. 9. 810382. 10.3389/fmed.2022.810382.
3. Lin Q, Musa SS, Zhao S, He D. (2020) *Modeling the 2014--2015 Ebola Virus Disease oubtreaks in Sierra Leone, Guinea, and Liberia with effect of high- and low-risk susceptible individuals.* Bull Math Biol. 82(8):1--23. 10.1007/s11538-020-00779-y.
4. Fan G, Yang Z, Lin Q, Zhao S, Yang L, He D. (2021) *Decreased case fatality rate of COVID-19 in the second wave: a study in 53 countries or regions.* Transbound Emerg Dis. 68(2):213--215. 10.1111/tbed.13819. **(Highly cited paper in 2020)**.
5. He D, Zhao S, Xu X, Lin Q, Zhuang Z, Cao P, Wang MH, Lou Y, Xiao L, Wu Y, Yang L. (2020) *Low dispersion in the infectiousness of COVID-19 cases implies difficulty in control.* BMC Public Health. 20:1558. 10.1186/s12889-020-09624-2.
6. Li C, Zhang X, Zhu Y, Lin Q, Zhao S, Yang L, Li X, He D, Stone L. (2020) *Excess pneumonia and influenza death as herald wave of COVID-19 in England and Wales, United Kingdom.* J Infect. 82(2):282--327. 10.1016/j.jinf.2020.09.019.
7. Zhuang Z, Zhao S, Lin Q, Cao P, Lou Y, Yang L, and He D. (2020) *Preliminary estimation of the novel coronavirus disease (COVID-19) cases in Iran: a modelling analysis based on overseas cases and air travel data.* Int J Infect Dis. 94:29--31. 10.1016/j.ijid.2020.03.019.
8. Zhuang Z, Zhao S, Lin Q, Cao P, Lou Y, Yang L, Yang S, He D, Xiao L. (2020) *Preliminary estimates of the reproduction number of the coronavirus disease (COVID-19) outbreak in Republic of Korea and Italy by 5 March 2020.* Int J Infect Dis. 95:308--310. 10.1016/j.ijid.2020.04.044.
9. He D, Zhao S, Lin Q, Zhuang Z, Cao P, Wang MH, and Yang L (2020). *The relative transmissibility of asymptomatic cases among close contacts.* Int J Infect Dis. 94:145--147. 10.1016/j.ijid.2020.04.034.
10. Lin Q, Zhao S, Gao D, Lou Y, Yang S, Musa SS, Wang MH, Cai Y, Wang W, Yang L, He D. (2020) *A conceptual model for the outbreak of coronavirus disease 2019 (COVID-19) in Wuhan, China with individual reaction and governmental action.* Int J Infect Dis. 93:211-216. 10.1016/j.ijid.2020.02.058. **(Highly cited paper in 2020)**.
11. Zhao S, Lin Q, Ran J, Musa SS, Yang G, Wang W, Lou Y, Gao D, Yang L, He D, and Wang MH.(2020) *Preliminary estimation of the basic reproduction number of novel coronavirus (2019-nCoV) in China, from 2019 to 2020: A data-driven analysis in the early phase of the outbreak.* Int J Infect Dis. 92:214--217. 10.1016/j.ijid.2020.01.050. **(Highly cited paper in 2020)**.
12. Zhao S, Musa SS, Lin Q, Ran J, Yang G, Wang W, Lou Y, Yang L, Gao D, He D, and Wang MH.(2020) *Estimating of the unreported number of novel coronavirus (2019-nCoV) cases in China in the first half of January 2020: A data-driven modelling analysis of the early outbreak.* J Clinic Med. 9(2):388. 10.3390/jcm9020388. **(Highly cited paper in 2020)**.
13. Yu D*, Lin Q*, Chiu APY, He D.(2017) *Effects of Reactive Social Distancing on the 1918 Influenza Pandemic.* PLOS ONE. 12(7):e0180545. 10.1371/journal.pone.0180545.

Teaching

Instructor *Annual Summer Institute in Statistics and Modeling in Infectious Diseases* (SISMID) *Jul 2024—*
Module: Simulation-Based Inference for Epidemiological Dynamics

Teaching Assistant *13rd Annual Summer Institute in Statistics and Modeling in Infectious Diseases* (SISMID) *Jul 2021*
Module: Simulation-Based Inference for Epidemiological Dynamics

Instructor *University of Michigan, Ann Arbor* *May 2021—Jun 2021*
MATH/STAT 425: Introduction to Probability (online teaching)

Teaching Assistant *Hong Kong Polytechnic University* *Nov 2015—Jan 2018*
AMA1110: Basic Mathematics I - Calculus and Probability & Statistics
AMA1130: Calculus for Engineers

* equal contribution

Talks & posters

Invited talk *Phyloseminar #144, live streaming* *Mar 2025*
Invited talk *School of Biological Sciences, University of Oklahoma* *Mar 2025*
Invited talk *Division of Biostatistics, The Ohio State University* *Feb 2025*
Poster *The 2024 Ecology and Evolution of Infectious Diseases (EEID) Conference, Stanford, USA* *Jun 2024*
Invited talk *Dept. Epidemiology and Biostatistics, Michigan State University, East Lansing, USA* *May 2022*
Invited talk *Dept. Mathematics and Statistical Science, University of Idaho* *Mar 2022*
Contributed talk *Society of Mathamtical Biology Annual Meeting 2021, Virtual* *Jun 2021*
Invited talk *Michigan Institute for Data Science, University of Michigan, Ann Arbor, USA* *Mar 2020*
Invited talk *Center for Tuberculosis Research, Johns Hopkins University, Baltimore, USA* *Dec 2018*
Invited talk *Society of Mathamtical Biology Annual Meeting 2018, Sydney, Australia* *Jul 2018*
Invited talk *International Conference on Big Data and Information Analytics 2016, Changsha, China* *Oct 2016*

Affiliations

Member *Society for Modeling and Theory in Population Biology (SMTPB)* *2024—*
Member *Society for the Study of Evolution (SSE)* *2023—*
Member *Society for Industrial and Applied Mathematics (SIAM)* *2022—*
Member *Society of Mathematical Biology (SMB)* *2022—*
Member *Modeling of Infectious Disease Agent Study (MIDAS)* *2020—*
Member *Institute of Mathematical Statistics (IMS)* *2020*
Student Member *Society for Industrial and Applied Mathematics* *2018*
Student Member *Society of Mathematical Biology* *2018*

Reviews

American Journal of Preventive Medicine, Bioinformatics, Bulletin of Mathematical Biology, Chaos, Solitons & Fractals, Computer Methods and Programs in Biomedicine, Frontiers Digital Health, Infectious Disease Modeling, Infectious Diseases of Poverty, International Journal of Infectious Diseases, Mathematical Biosciences and Engineering, Nature Communications, PLOS Computational Biology, PLOS ONE, Proceedings of the National Academy of Sciences, Scientific Reports, Transboundary and Emeging Diseases.

Community service, outreach & professional

Judge *Quicken Loans Data Challenge* *Apr 2021*
Judge *U-M Data Science Annual Symposium Poster Session* *Nov 2020*
Interviewee *Women in Science and Engineering Residence Program (WISE RP)* *Oct 2020*
Junior Reviewer *Microsoft Azure credits proposal* *Oct 2020*
Judge *Sport Data Madness Challenge* *Apr 2020*
Research Assistant *Hospital Authority, Hong Kong* *Feb 2019—Aug 2019*
Visiting Scholar *University of Michigan, Ann Arbor* *Sept 2018—Feb 2019*
Research Assistant *Esquel Group, Hong Kong* *Mar 2018—Sept 2018*
Research Assistant *Avalon Genomics, Ltd., Hong Kong* *Jan 2017—Jan 2018*
Research Assistant *AIDS Concern (NGO), Hong Kong* *Jan 2017—Jan 2018*
Data Scientist *SupStat Inc. & NYC Data Science Academy, Beijing & New York* *Jun 2014—Jun 2015*

References

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