Hiroaki Murayama
Curriculum Vitae
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Education

2019 – present **Medical Student**, Department of Medicine, School of Medicine, International University of Health and Welfare, Chiba, Japan

Career/Academic Appointments

2024 – present **Research Associate, SPARK Lab NYC, Environmental Health Sciences, Columbia University, New York, The United States** (Supervisor: Asst. Prof. Robbie M. Parks)
- Spatio-temporal hierarchical modelling in the context of tropical cyclone impacts on deaths.

2020 – 2024 **Advisor, The National COVID-19 Cluster Taskforce, Ministry of Health, Labour and Welfare, Tokyo, Japan** (Supervisor: Prof. Hiroshi Nishiura)
- Performed ad-hoc analysis and research to provide risk assessment of the coronavirus disease 2019 (COVID-19) epidemic and evaluate the impact of public health responses
- Estimation and projection of the Alpha variant epidemic, evaluating vaccine effectiveness against death from population-level data, exploring the impact of healthcare burden on temporal case fatality risk, and more. (e.g. Murayama et al. *Theo Bio Med Model*. 2021; Ko et al. *NIID*. 2021; Ko et al. *Emerg Inf Dis*. 2022)

2022 – 2023 **Research Assistant, Graduate School of Public Policy, The University of Tokyo, Japan** (Supervisor: Assoc. Prof. Taisuke Nakata)
- Collaborated with economists on research into COVID-19 response strategies.

2021 – 2023 **Member, CoV-Navi** (https://covnavi.jp/)
- Reviewed scientific evidence regarding vaccines against COVID-19 for science communication to the general public.

2021 – 2022 **Research Assistant, Graduate School of Social Sciences, Chiba University, Chiba, Japan** (Supervisor: Assist Prof. Shouto Yonekura)
- Proposed a novel Bayesian framework for estimating waning vaccine effectiveness from population-level surveillance data in the presence of multi-variant circulation, working with Dr. Akira Endo. (Murayama et al. *Epidemics*. 2023)

Publications

Peer-Reviewed Original Research (†: equal contribution)

1. Ejima K†, Wang Y†, Endo A†, Murayama H, Goh YS, Cook AR, Jeong YD, Iwami S, Park H, Dickens BSL, Jin S, Lim JT, Chan CEZ, Chia PY, Young BE, Chio M, Lye DC, Ajelli M. Evaluating the Effectiveness of International Travel Controls to Identify Monkeypox Virus Infected Travelers: A Simulation Study. **BMC Medicine**. 2025 (in press)
2. Asakura TR, Jung S, Murayama H, Ghaznavi C, Sakamoto H, Teshima A, Miura F, Endo A. Modelling international spread of clade IIb mpox on the Asia continent. **Bulletin of the World Health Organization**. 2025;103(7):429-436.
3. Jung S†, Miura F†, Murayama H, Funk S, Wallinga J, Lessler J, Endo A. Dynamic landscape of mpox importation risks driven by heavy-tailed sexual contact networks among men who have sex with men in 2022: a mathematical modeling study. **The Journal of Infectious Diseases**. 2024;jiae433.
4. Murayama H, Endo A, Yonekura S. Estimation of waning vaccine effectiveness from population-level surveillance data in multi-variant epidemics. **Epidemics**. 2023;100726.
5. Murayama H, Pearson CAB, Abbott S, Miura F, Jung S, Fearon E, Funk S, & Endo A. Accumulation of immunity in heavy-tailed sexual contact networks shapes mpox outbreak sizes. **The Journal of Infectious Diseases**. 2023 Jul 4;jiad254.
6. Endo A, Murayama H, Abbott S, Ratnayake R, Pearson CAB, Edmunds WJ, Fearon E†, Funk S†. Heavy-tailed sexual contact networks and monkeypox epidemiology in the global outbreak, 2022. **Science**. 2022 Sep 25;0(0):eadd4507.
7. Ko Y, Murayama H, Yamasaki L, Kinoshita R, Suzuki M, Nishiura H. Age-Dependent Effects of COVID-19 Vaccine and of Healthcare Burden on COVID-19 Deaths, Tokyo, Japan. **Emerging Infectious Diseases**. 2022;28(9).
8. Murayama H†, Yamasaki L†, Hashizume M. The impact of temperature on the transmissibility and virulence of COVID-19 in Tokyo, Japan. **Scientific Reports**. 2021;11(1):24477.
9. Murayama H, Kayano T, Nishiura H. Estimating COVID-19 cases infected with the variant alpha (VOC 202012/01): an analysis of screening data in Tokyo, January-March 2021. **Theoretical Biology and Medical Modelling**. 2021;18(1):13.

Under Review (†: equal contribution)

1. Murayama H†, Asakura TR†, Dickens BL, Foo JH, Jin S, Mukadi PK, Prem K, Endo A. Roles of community and sexual contacts as drivers of clade I mpox outbreaks. **medRxiv**. 2024 Jan;2024.10.15.24315554.
2. Murayama H, Nishi A, Endo A. Different time scales used for sexual partner surveys pose a challenge in modelling dynamics of sexually transmitted infections. **medRxiv**. 2023 Jan 1;2023.12.25.23300526.

Journal Correspondence

1. Jung S, Miura F, Murayama H, Funk S, Wallinga J, Lessler J, Endo A. Preemptive Mpox Vaccine Deployment: Aligning Strategy with Reality. **The Journal of Infectious Diseases**. 2025 Jul 21;jiaf365

Report

1. Ko KY, Murayama H, Yamasaki L, Kinoshita R, Nishiura H, Suzuki M. Evaluating the Age-Specific Effectiveness of COVID-19 Vaccines Against Death from surveillance data in Tokyo. **National Institute of Infectious Diseases, Infectious Diseases Surveillance Center**. 2021 Dec. https://id-info.jihs.go.jp/niid/ja/2019-ncov-e/10873-covid19-65.html (in Japanese)
2. Ko KY, Murayama H, Yamasaki L, Kinoshita R, Nishiura H, Suzuki M. Evaluating the Age-Specific Effectiveness of COVID-19 Vaccines Against Death from surveillance data in Tokyo. **Materials 3-2, 65th Advisory Board Meeting, Ministry of Health, Labour and Welfare on COVID-19 Countermeasures (28 December 2021), 79-90**. 28 Dec 2021. https://www.mhlw.go.jp/content/10900000/000875165.pdf (in Japanese)

Conference (†: equal contribution)

1. Murayama H, Endo A. Transmission dynamics and risk assessment of mpox clade IIb and Ib within men who have sex with men. **Early Career Researcher Sandbox session, Infectious Disease Modelling conference**. 2024 Nov. Bangkok, Thailand. (Oral)
2. Murayama H. Impacts of vaccine, healthcare burden, and temperature on the transmissibility or virulence of COVID-19. **COVID-19 pandemic conference**. 2022 Sep. Nagoya, Japan. (Oral)

Skills and professional development

Technical Expertise

- Research areas
  (i) Infectious disease epidemiology and mathematical modelling of infectious diseases (COVID-19, mpox clade I and II, sexually-transmitted infections, dengue, vaccine effectiveness),
  (ii) Environmental epidemiology, focusing on interactions between infectious disease dynamics and temperature, and tropical cyclones.
- Data-analysis and scripting languages: R, Julia, Stan.
- Statistical computing environments: Jupyter Lab (via Windows), Docker environments; familiar with RStudio,
- Other software: Microsoft Office, GitHub Desktop, Mendeley.
- Markup languages: LaTeX, Markdown; familiar with HTML, XML, CSS.
- Experience with Bayesian methods, maximum likelihood estimation, differential equations, stochastic process, branching process, spatio-temporal modelling, network modelling.

Language

- Japanese (native)
- English (advanced)

Professional Services

Reviewer for peer-reviewed journals

2024 PLoS Neglected Tropical Diseases
2023 PLoS ONE (co-review with Dr. Akira Endo)
2023 The Journal of Infectious Diseases (co-review with Dr. Akira Endo)

Teaching Experience

July 2023 Teaching Assistant, Introduction to Infectious Disease Epidemiology and Modelling, School of Tropical Medicine and Global Health, Nagasaki University, Japan

Membership

1. Japan Epidemiological Association
2. Japanese Society of Tropical Medicine