

## Education

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

## Career/Academic Appointments

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2024 – **Lab Associate, SPARK Lab NYC, Environmental Health Sciences, Columbia University, New York, The United States (Asst. Prof. Robbie M. Parks)**

Spatio-temporal modelling in the context of tropical cyclone impacts on health.

2020 – 2024 **Advisor, The National COVID-19 Cluster Taskforce, Ministry of Health, Labour and Welfare, Tokyo, Japan (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, including 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. (Murayama et al. *Theo Bio Med Model.* 2021; Ko et al. *Emerg Inf Dis.* 2022)

2022 – 2023 **Research Assistant, Graduate School of Public Policy, University of Tokyo, Japan (Assoc. Prof. Taisuke Nakata)**

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 (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.* 2024)

## Publications

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### Peer-Reviewed Original Research (†: equal contribution)

- 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.
- Murayama H, Endo A, Yonekura S. Estimation of waning vaccine effectiveness from population-level surveillance data in multi-variant epidemics. **Epidemics.** 2023;100726.
- 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.
- 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.
- 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).
- 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.
- 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)

- 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.
- Asakura TR, Jung S, Murayama H, Ghaznavi C, Sakamoto H, Teshima A, Miura F, Endo A. Projecting international mpox spread in Asia: ongoing global health risk. **medRxiv.** 2024 Jan 1;2024.04.17.24305832.
- 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.

### Report

- 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://www.niid.go.jp/niid/ja/2019-ncov/2484-idsc/10873-covid19-65.html> (Japanese only)

## **Conference** (†: equal contribution)

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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**

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### **Technical Expertise**

- Data-analysis and scripting languages: R, Julia, Stan.
- Statistical computing environments: Jupyter Lab (via Windows), Docker environment; 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, network modelling approaches.
- Work on infectious disease epidemiology, mathematical modelling of infectious diseases, environmental epidemiology, COVID-19, mpox, sexually transmitted infections, sexual contact network, temperature.

### **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**

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