Fuminari Miura

Current Position: Postdoctoral fellow

Affiliation: Unit of Infectious Disease Modeling, Center for Infectious Disease Control,
The National Institute for Public Health and the Environment (RIVM), the Netherlands

Department of Biomedical Data Sciences, Leiden University Medical Center (LUMC), the Netherlands

Molecular Ecology and Health Lab, Center for Marine Environmental Studies (CMES), Ehime University, Japan

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Citizenship: Japan

Language: English (Proficient), Japanese (Native)

Education

Ph.D. (Engineering), Urban Engineering, The University of Tokyo, 2017-2020
MS (Engineering), Urban Engineering, The University of Tokyo, 2014-2017
BS (Engineering), Urban Engineering, The University of Tokyo, 2010-2014

Research interests

Infectious disease modelling, Risk analysis, Environmental science

Skills (Research techniques)

Statistical analysis and mathematical modelling (R, Stan, Julia, Python, JMP)
Basic operation in molecular biology (Extracting RNAs, PCR methods, Cell cultures, etc.)

Professional Positions

2015.04 – 2016.03
  Adjunct Research Fellow, Research institute of capital formation, Development bank of Japan
2016.05 – 2016.08
  Internship, Water, Sanitation, Hygiene and Health, Department of Public Health, Social and Environmental Determinants of Health, World Health Organization (Headquarter, Geneva), Switzerland
2016.09 – 2017.12
  Visiting researcher, Graduate School of Medicine, Hokkaido University, Japan
2017.04 – 2020.03
  JSPS Research Fellow (DC1), Graduate School of Engineering, University of Tokyo, Japan
2018.10 – 2020.03
  Visiting researcher, the National Institute for Public Health and the Environment (RIVM), the Netherlands
2020.04 – Present
  JSPS Postdoctoral Research Fellow (SPD/CPD), Center for Marine Environmental Studies (CMES), Ehime University, Japan
2020.04 – Present
  JSPS Postdoctoral Research Fellow (SPD/CPD), the National Institute for Public Health and the Environment (RIVM), the Netherlands
2020.09 – present
  JSPS Postdoctoral Research Fellow (SPD/CPD), Department of Biomedical Data Sciences, Leiden University Medical Center (LUMC), the Netherlands

Publications

Peer-reviewed journal paper

1)   **Miura, F.***, van Ewijk, C. E., Backer, J. A., Xiridou, M., Franz, E., de Coul, E. O., Brandwagt, D., van Cleef,

B., van Rijckevorsel, G., Swaan, C., van den Hof, S., & Wallinga, J. (2022). Estimated incubation period for monkeypox cases confirmed in the Netherlands, May 2022. Eurosurveillance, 27(24), 2200448.

2) Torii, S., Corre, M. H., **Miura, F.**, Itamochi, M., Haga, K., Katayama, K., Katayama, H., & Kohn, T. (2022). Genotype-Dependent Kinetics of Enterovirus Inactivation by Free Chlorine and Ultraviolet (UV) Irradiation. Water Research, 118712.

3) **Miura, F.***, Leung, K. Y., Klinkenberg, D., Ainslie, K. E., & Wallinga, J. (2021). Optimal vaccine allocation for COVID-19 in the Netherlands: a data-driven prioritization. *PLOS Computational Biology*, 17 (12), e1009697

4) McDonald, S. A., **Miura, F.**, Vos, E. R., van Boven, M., de Melker, H. E., van der Klis, F. R., ... & Wallinga, J. (2021). Estimating the asymptomatic proportion of SARS-CoV-2 infection in the general population: Analysis of nationwide serosurvey data in the Netherlands. *European journal of epidemiology*, 1-5.

5) Omori, R., **Miura, F.**, & Kitajima, M. (2021). Age-dependent association between SARS-CoV-2 cases reported by passive surveillance and viral load in wastewater. Science of The Total Environment, 148442.

6) Torii, S., **Miura, F.**, Itamochi, M., Haga, K., Katayama, K., & Katayama, H. (2021). Impact of the Heterogeneity in Free Chlorine, UV254, and Ozone Susceptibilities Among Coxsackievirus B5 on the Prediction of the Overall Inactivation Efficiency. *Environmental Science & Technology*, 55(5), 3156-3164.

7) Murakami, M., **Miura, F.**, Kitajima, M., Fujii, K., Yasutaka, T., Iwasaki, Y., ... & Imoto, S. (2021). COVID-19 risk assessment at the opening ceremony of the Tokyo 2020 Olympic Games. *Microbial risk analysis*, 100162.

8) **Miura, F.***, Kitajima, M., & Omori, R. (2020). Duration of SARS-CoV-2 viral shedding in faeces as a parameter for wastewater-based epidemiology: Re-analysis of patient data using a shedding dynamics model. Science of The Total Environment, 144549.

9) Matsuyama, R., **Miura, F.**, Tsuzuki, S., & Nishiura, H.* (2018). Household transmission of acute gastroenteritis during winter season in Japan. Journal of International Medical Research, 0300060518776451.

10) **Miura, F.**, Matsuyama, R. & Nishiura, H.* (2018). Estimating the asymptomatic ratio of norovirus infection during foodborne outbreaks with laboratory testing in Japan. Journal of Epidemiology, je20170040.

11) Tsuzuki, S., Lee, H., **Miura, F.**, Chan, Y. H., Jung, S. M., Akhmetzhanov, A. R., & Nishiura, H*. (2017). Dynamics of the pneumonic plague epidemic in Madagascar, August to October 2017. Eurosurveillance, 22(46), 17-00710.

12) Matsuyama, R., **Miura, F.**, & Nishiura, H.* (2017). The transmissibility of noroviruses: Statistical modeling of outbreak events with known route of transmission in Japan. PloS one, 12(3), e0173996.

13) **Miura, F.***, Watanabe, T., Watanabe, K., Takemoto, K., & Fukushi, K. (2016). Comparative assessment of primary and secondary infection risks in a norovirus outbreak using a household model simulation. Journal of Environmental Sciences, 50, 13-20.

14) **Miura, F.***, Watanabe, T., Watanabe, K., & Fukushi, K. (2014). Development of transmission model for Norovirus gastroenteritis considering secondary infection in household. J. JSCE, Ser.G (Environmental Research), 70(7)

Other publications

1) World Health Organization. (2016). Quantitative microbial risk assessment: application for water safety management.

Preprints

1) van Boven, M.*, Hetebrij, W. A., Swart, A. M., Nagelkerke, E., van der Beek, R., Stouten, S., Hoogeveen, R.T., **Miura, F.**, Kloosterman, A., van der Drift, A.R., Welling, A., Lodder, W.J., & de Roda Husman, A. (2022). Modelling patterns of SARS-CoV-2 circulation in the Netherlands, August 2020-February 2022, revealed by a nationwide sewage surveillance program. *medRxiv*.

2) **Miura, F.***, Klinkenberg, D., & Wallinga, J. (2022). Dose-response modelling of endemic coronavirus and SARS-CoV-2: human challenge trials reveal the individual variation in susceptibility. *medRxiv*.

3) Ainslie, K. E. C., Backer, J. A., de Boer, P., van Hoek, A. J., Klinkenberg, D., Altes, H. K., Leung, K. Y., de Melker, H., **Miura, F.**, & Wallinga, J. (2021). The impact of vaccinating adolescents and children on COVID-19 disease outcomes. *medRxiv*.

Presentations

International conferences

1) **Miura, F.***, Omori, R., & Kitajima, M.; Time course of SARS-CoV-2 viral shedding in feces: a modelling study. 7th Food and Environmental Virology Conference, Santiago de Compostela, May 2022 [Oral, peer-reviewed]

2) **Miura, F.***, Klinkenberg, D., & Wallinga, J.; Inferring vaccine efficacy and mode of action from human challenge studies. 8th International Conference on Infectious Disease Dynamics, Online, December 2021 [Oral, peer-reviewed]

3) Ainslie, K. E., Backer, J., de Boer, P., van Hoek A. J., Klinkenberg, D., Lagerwij, G., McDonald, S., **Miura, F.**, & Wallinga, J.; The impact of vaccinating adolescents on SARS-CoV-2 transmission: a modelling study. 8th International Conference on Infectious Disease Dynamics, Online, December 2021 [Poster, peer-reviewed]

4) **Miura, F.***, Klinkenberg, D., & Wallinga, J.; How to use human challenge studies to predict the effect of variable susceptibility on infection dynamics and the impact of vaccination: an application for norovirus. 7th International Conference on Infectious Disease Dynamics, Charleston (SC), December 2019 [Poster, peer-reviewed]

5) **Miura, F.***, Watanabe, T., Watanabe, K. Nishiyama M., Ito, E., Yanagihara, M. & Fukushi, K.; Effect of personal hygiene on norovirus transmission within and among households. The 20th International Symposium on Health-Related Water Microbiology (International Water Association, Health-Related Water Microbiology), Vienna, September 2019 [Poster, peer-reviewed]

6) **Miura, F.***, Watanabe, T., Watanabe, K., Hata, A., & Fukushi, K.; Statistical Forecasting Of Norovirus Concentration In Sewage As An Indicator Of Future Incidence, the IWA World Water Congress & Exhibition 2018, 2018 [Oral, peer-reviewed]

7) **Miura, F**. and Nishiura, H.*; Estimating the transmissibility of norovirus in household settings from final size distributions. Innovative mathematical modeling for the analysis of infectious disease data (IMAID) 2017, 2017 [Oral, peer-reviewed]

8) **Miura, F.***, Watanabe, T., Watanabe, K., & Fukushi, K.; Time series analysis of seasonal correlation between concentration of norovirus in sewage and clinical cases of acute gastroenteritis. The 19th International Symposium on Health-Related Water Microbiology (International Water Association, Health-Related Water Microbiology), 2017 [Oral, peer-reviewed]

9) **Miura, F**. and Nishiura, H.*; Statistical estimation of the asymptomatic ratio of norovirus infection using laboratory testing results during foodborne outbreaks in Japan. Innovative mathematical modeling for the analysis of infectious disease data (IMAID) 2016, 2016 [Oral, peer-reviewed]

10) **Miura, F.*** and Fuksuhi, K.; "Development of a detection system of infectious diseases by monitoring datasets in environment", 3rd JSPS/GRENE-EcoHealth joint International Symposium on Development of International Network on Health Risk Assessment in Urban Area, Bali, Indonesia, March 2016 [Oral, not peer-reviewed]

11) **Miura, F.***, Watanabe, T., Watanabe, K., & Fukushi, K.; Comparative assessment of primary and secondary infection risks in a norovirus outbreak using a household model simulation, 6th IWA-ASPIRE, 2015 [Oral, peer-reviewed]

12) **Miura, F.*** & Fuksuhi, K.; An epidemic simulation related with foodborne infection in rural areas. The joint project between University of Tokyo and the government of Tianjin city "the sustainable development based on the harmonization of urban and rural areas", 2015 [Oral, not peer-reviewed]

Non-international conferences

1) Arakawa, C., **Miura, F.**, Iwamoto, R., Sakon, N., Hashimoto, A., Haramoto, E., Okabe, S., & Kitajima, M.*; Capturing transmission trends of COVID-19 via wastewater-based epidemiology survey in multiple cities in Japan, the 56th annual conference of Japan Society on Water Environment (JSWE), Toyama (online), 2022 March [Oral, peer-reviewed, in Japanese]

2) Arakawa, C., **Miura, F.**, Iwamoto, R., Sakon, N., Hashimoto, A., Haramoto, E., Okabe, S., & Kitajima, M.*; Long-term and quantitative wastewater surveillance in multiple cities in Japan, the 58th Forum of Japan Society of Civil Engineers (JSCE), 2021 November [Oral, peer-reviewed, in Japanese]

3) Arakawa, C., **Miura, F.**, Iwamoto, R., Sakon, N., Hashimoto, A., Haramoto, E., Okabe, S., & Kitajima, M.*; Estimating SARS-CoV-2 circulations by long-term wastewater monitoring in multiple cities in Japan, the 24rd Symposium of Japan Society on Water Environment (JSWE), Online, 2021 September [Oral, peer-reviewed, in Japanese]

4) **Miura, F.***, Omori, R., Kitajima, M., & Watanabe, K.; Wastewater surveillance for COVID-19 and disease control: a perspective from mathematical epidemiology, the 55nd annual conference of Japan Society on Water Environment (JSWE), Kyoto (online), 2021 March [Oral, peer-reviewed, in Japanese]

5) Arakawa, C., **Miura, F.**, Okabe, S., & Kitajima, M.*; Detection of SARS-CoV-2 RNA in Wastewater during a COVID-19 Epidemic Period, the 55nd annual conference of Japan Society on Water Environment (JSWE), Kyoto (online), 2021 March [Oral, peer-reviewed, in Japanese]

6) **Miura, F.*** ; Statistical Inference with Behavioral and Microbial Datasets for Spread of Infectious Diseases via Hidden Cases, (JSWE-ORGANO Awards session), the 23rd Symposium of Japan Society on Water Environment (JSWE), Miyazaki (online), 2020 September [Oral, peer-reviewed, in Japanese]

7) **Miura, F.**, Arakawa, C., Haramoto, E., & Kitajima, M.*; Development and Application of a Mathematical Model to Estimate the Number of COVID-19 Infections Based on SARS-CoV-2 RNA Concentrations in Wastewater, the 23rd Symposium of Japan Society on Water Environment (JSWE), Miyazaki (online), 2020 September [Oral, peer-reviewed, in Japanese]

8) **Miura, F.***, Yanagihara, M., & Fukushi, K.; Forecasting Acute Gastroenteritis Cases Using Time Series of Norovirus Concentration in Sewage, the 54nd annual conference of Japan Society on Water Environment (JSWE), Iwate (online), 2020 March [Oral, peer-reviewed, in Japanese]

9) Watanabe, T.*, **Miura, F.**, Nishiyama, M., Ito, E., Kato, K., Ohsumi, H., & Omura, T.; Monitoring of norovirus in municipal wastewater and warning for epidemics of infectious gastroenteritis: A project in Sendai city, the 53nd annual conference of Japan Society on Water Environment (JSWE), Yamanashi, 2019 March [Oral, peer-reviewed, in Japanese]

10) **Miura, F.**, Matsuyama, R., Fukushi, K., & Nishiura, H.*; Estimating the transmissibility of norovirus via asymptomatic cases, the 52nd annual conference of Japan Society on Water Environment (JSWE), 2018 [Oral, peer-reviewed, in Japanese]

11) **Miura, F.*** and Fuksuhi, K.; Development of a portable sampler to quantify the concentration of aerosolized viruses in air. JSWE symposium on health related water microbiology symposium "Towards Quantitative Microbial Risk Management of water", 2015 [Poster, peer-reviewed, in Japanese]

12) **Miura, F.***, Watanabe, T., Watanabe, K., & Fukushi, K.; Development of transmission model for Norovirus gastroenteritis considering secondary infection in household. J. the 51th Forum of Japan Society of Civil

Engineers (JSCE), 2014 [Oral, peer-reviewed, in Japanese]

Invited talks and presentations

1) **Miura, F**; Incubation period for monkeypox cases confirmed in the Netherlands, May 2022, WHO calls for the monkeypox data analytics, Online (Geneva), July 2022 [Invited talk]
2) **Miura, F**; Incubation period for monkeypox cases confirmed in the Netherlands, May 2022, 6th ECDC/EACS webinar on the monkeypox outbreak, Online (Stockholm), July 2022 [Invited talk]
3) **Miura, F**; Determining optimal vaccine allocation with approximation of next generation matrices, UMC Utrecht seminar series, Utrecht, April 2022 [Invited talk]
4) **Miura, F**; Wastewater as an alternative surveillance: how can we translate environmental data into public health implications via mathematical modelling? Innovation for Prediction and Decision Making in Health Care from Data-driven Approach, the Tsukuba Conference, Tokyo (Online), September 2021 [Invited talk]
5) **Miura, F**; Wastewater as an interface between environmental engineering and epidemiology. International symposium of Ecology and Civil Engineering Society of Japan, Online, September 2021 [Invited talk]
6) **Miura, F**; Understanding hidden transmission dynamics via wastewater data and mathematical modelling. Neo ME seminar, Nagoya University, Online, July 2021 [Invited talk]
7) **Miura, F**; Implications of wastewater-based epidemiology: can wastewater data reveal hidden transmissions? International Joint Usage/Research Center-Young Researchers Symposium: The Power of Data Science to Accelerate Health Medical Research, Institute of Medical Science, the University of Tokyo, Online, March 2021 [Invited talk]
8) **Miura, F**; Current status of wastewater-based epidemiology: can wastewater data tell the emergence of epidemics? 2nd Symposium of JSPS Core-to-Core Program, Center of Excellence in Health Risk Assessment for Adaptation to Climate Change, Online, March 2021 [Invited talk]

Grants/Scholarships

1) Fund for the Promotion of Joint International Research (Fostering Joint International Research (B)), Grant-in-Aid for Scientific research (KAKENHI) for FY2021, Japan: "Why do mosquito vectors not get sick by virus infections? Understanding the molecular mechanisms of mosquito tolerance to viral infections" (19.2 million JPY, 2021.10-2025.03) [co-PI]
2) Grant-in-Aid for JSPS Research Fellow (CPD), Japan Society for the Promotion of Science (JSPS) (19.5 million JPY, 2020.10-2025.03) [PI]
3) Grant-in-Aid for JSPS Research Fellow (SPD), Japan Society for the Promotion of Science (JSPS) (11.7 million JPY, 2020.04-2023.03, switched to CPD from 2020.10) [PI]
4) Grant-in-Aid for JSPS Research Fellow (Overseas), Japan Society for the Promotion of Science (JSPS) (18.9 million JPY, declined to receive SPD fellowship) [PI]
5) Grant-in-Aid for JSPS Research Fellow (Ikushi Prize), Japan Society for the Promotion of Science (JSPS) (4.5 million JPY, declined to receive SPD fellowship) [PI]
6) Grant-in-Aid for JSPS Research Fellow (DC1), Japan Society for the Promotion of Science (JSPS) (2.8 million JPY, 2017.04 – 2020.03) [PI]
7) Graduate program for social ICT Global creative leaders, The University of Tokyo, (2.2 million JPY, 2015.04 – 2017.03) [PI]

Awards

1) Japan Society of Civil Engineers' Award for Environmental Technology and Project (Title: " Long-term and quantitative wastewater surveillance in multiple cities in Japan"), the 58th Environmental Engineering Research Forum, November 2021 [as a co-author]
2) Japan Society on Water Environment (JSWE) Best Doctoral Research Award (Organo Award), 23th Annual Symposium of Japan Society on Water Environment, September 2020
3) Japan Society on Water Environment (JSWE) JSWE-President Award, Japan Society on Water Environment (JSWE), May 2020
4) 10th JSPS Ikushi Prize, Japan Society for the Promotion of Science (JSPS), March 2020
5) Graduate School of Engineering Dean's Award (Best research), Graduate School of Engineering, The University of Tokyo, March 2020
6) Distinguished Doctoral Research Award, Department of Urban Engineering, Graduate School of Engineering, The University of Tokyo, March 2020
7) Japan Society of Civil Engineers' Award for Environmental Technology and Project (Title: "Monitoring of norovirus in municipal wastewater and warning for epidemics of infectious gastroenteritis: A project in Sendai city"), the 56th Environmental Engineering Research Forum, December 2019 [as a co-author]
8) Kurita innovative researcher award, Asia–pacific network for global change research (APN) proposal development training workshop, Tokyo, September 2018
9) Best presentation award, Innovative mathematical modeling for the analysis of infectious disease data (IMAID) 2017, November 2017

Teaching experience

Lectures

1) Invited lecturer, "Exercise of a Project on Civil and Environmental Engineering", Infrastructure Engineering

Course and Civic Design Course, Department of Civil and Environmental Engineering, Ehime University, Japan (2021.11)
2) Invited lecturer, "Advanced Future Society Design", World-leading Innovative Graduate Study Program Co-Designing Future Society (WINGS-CFS) Program (selected master and PhD students' program), the University of Tokyo (2020.08)
3) Invited lecturer, "Design Exercise of Civil and Environmental Engineering", Infrastructure Engineering Course and Civic Design Course, Department of Civil and Environmental Engineering, Ehime University, Japan (2020.06)
4) Teaching Assistant, "Exercises in Urban Engineering B-1", Department of Urban Engineering, Graduate school of Engineering, The University of Tokyo (2017.06 – 2017.07)
5) Teaching Assistant, "Exercises in Urban Engineering C", Department of Urban Engineering, Graduate school of Engineering, The University of Tokyo (2017.12 – 2018.02)

Faculty development programme
1) UTokyo Future faculty development programme (FFP), The University of Tokyo (certified on 2017.09)

Academic service

Peer-review
- PLoS Computational Biology
- Epidemiology and Infection
- Theoretical Microbiology and Medical Modelling
- PLoS ONE
- PeerJ
- Science of the Total Environment
- Water Research

Society
- Japan epidemiological association
- Japan society on water environment
- Japan society of civil engineering

Other publications
- "Twelve emerging issues for future earth (Japanese textbook for primary schools)". Gakken Plus. 2021.ISBN: 4055013698. (Chapter 8: Pandemics)
- "Water environment in the Netherlands (newspaper for kids, in Japanese)". Japan Wastewater Newspaper. 2022. Tokyo