Dr Mélodie Monod

CONTACT DETAILS

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PROFILE

I am a dedicated professional who have led and produced high impact work (published in journals such as Nature and Science) that has garnered 5k+ citations. My expertise lies in utilizing scalable Bayesian methods and models to gain a comprehensive understanding of complex public health and biological phenomena. I have experience in spatio-temporal models, survival models, computer vision models and scalable inference techniques.

EXPERIENCE

Novartis, Dublin, Ireland — Since January 2023
Principal Biostatistician
I am developing original statistical methods for pharmaceutical applications. I am also concurrently collaborating on a joint initiative with the FDA to integrate MRI data for survival prediction using deep learning.

Imperial College London, London, United Kingdom — Since April 2023
Academic Visitor
I engage to ongoing research collaborations with academic faculty, PhD students, and MSc students.

Novartis, Basel, Switzerland — 06/2021 - 09/2021
Advanced Explanatory Analysis Intern
Supervisor: Dr. Sebastian Weber
I have developed a time-to-first-event safety model that uses pharmacokinetic principles in the context of phase I oncology dose-escalation trials with multiple schedules.

University of Geneva, Geneva, Switzerland — 07/2017 - 09/2017
Summer Research Assistant
Supervisor: Dr. Bernard Cerutti
I have investigated cross-sectional medical data from the Hospital of Geneva to determine optimal training schedule for health personnel.

EDUCATION

Imperial College London, London, United Kingdom — 2019-2023
PhD in Modern Statistics and Statistical Machine Learning
Thesis title: Bayesian models and methods to estimate age-specific infectious disease transmission dynamics: integrating disease surveillance time series, mobility, and vaccination data
Supervisors: Dr. Oliver Ratmann, Prof. Samir Bhatt, Dr. Matthew Hall
First student to complete the program among a cohort of 14 students in Imperial College London and Oxford University

Imperial College London, London, United Kingdom — 2018-2019
Master of Science in Statistics
Final Grade: Distinction

University of Geneva, Geneva, Switzerland — 2015-2018
Bachelor of Science in Economics and Management
Final Grade: 5.71/6, **Class Rank:** First out of $>$ 100 students
Major in Economics and minor in Statistics

PROGRAMMING SKILLS

Highly proficient in R, Stan and LaTeX.

Open source code:

- Model for characterizing COVID-19 spread: https://github.com/ImperialCollegeLondon/covid19model
- Regularised B-splines Projected Gaussian Process Priors: https://github.com/ImperialCollegeLondon/BSplinesProjectedGPs
- Analysis of age-specific HIV transmission dynamics: https://github.com/MLGlobalHealth/phyloSI-RakaiAgeGender

AWARDS

EPSRC CDT in Modern Statistics and Statistical Machine Learning Scholarship 2019-2023
Imperial College London, London, United-Kingdom

The Department of Mathematics Scholarship for the MSc Statistics 2018
Imperial College London, London, United-Kingdom
Awarded for academic excellence and ability to continue into a postgraduate research degree.

Highest overall grade average of the Bachelor's Degree in Economics and Management - Major Economics 2018
University of Geneva, Geneva, Switzerland

TALKS

StanCon 2020 2020

COVID-19 Dynamics & Evolution Webinar Series, University of California San Diego 2020

Banff International Research Station for Mathematical Innovation and Discovery 2021

ISBA 2022 World Meeting 2022

SELECTED PUBLICATIONS

Mélodie Monod, et al. Longitudinal population-level HIV epidemiologic and genomic surveillance highlights growing gender disparity of HIV transmission in Uganda. *Nature Microbiology*, December 2023. doi: 10.1038/s41564-023-01530-8.

Mélodie Monod, et al. Regularised B-splines Projected Gaussian Process Priors to Estimate Time-trends in Age-specific COVID-19 Deaths. *Bayesian Analysis*, January 2022. doi: 10.1214/22-ba1334.

Alexandra Blenkinsop, Mélodie Monod, et al. Estimating the potential to prevent locally acquired HIV infections in a UNAIDS fast-track city, Amsterdam. *eLife*, 11, August 2022. doi: 10.7554/elife.76487.

Mélodie Monod, et al. Age groups that sustain resurging COVID-19 epidemics in the united states. *Science*, 371(6536), March 2021. doi: 10.1126/science.abe8372.

Seth Flaxman, Swapnil Mishra, Axel Gandy, H. Juliette T. Unwin, Thomas A. Mellan, Helen Coupland, Charles Whittaker, Harrison Zhu, Tresnia Berah, Jeffrey W. Eaton, Mélodie Monod, Imperial COllege COVID-19 Response Team, Azra C. Ghani, Christl A. Donnelly, Steven Riley, Michaela A. C. Vollmer, Neil M. Ferguson, Lucy C. Okell, and Samir Bhatt and. Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe. *Nature*, 584(7820):257–261, June 2020. doi: 10.1038/s41586-020-2405-7.

FURTHER PUBLICATIONS

[1] Shozen Dan, Yu Chen, Yining Chen, Melodie Monod, Veronika K. Jaeger, Samir Bhatt, André Karch, and Oliver Ratmann and. Estimating fine age structure and time trends in human contact patterns from coarse contact data: The bayesian rate consistency model. *PLOS Computational Biology*, 19(6):e1011191, June 2023. doi: 10.1371/journal.pcbi.1011191. URL https://doi.org/10.1371/journal.pcbi.1011191.

[2] Alexandra Blenkinsop, Mélodie Monod, Ard van Sighem, Nikos Pantazis, Daniela Bezemer, Eline Op de Coul, Thijs van de Laar, Christophe Fraser, Maria Prins, Peter Reiss, Godelieve J de Bree, and Oliver Ratmann and. Estimating the potential to prevent locally acquired HIV infections in a UNAIDS fast-track city, amsterdam. *eLife*, 11, August 2022. doi: 10.7554/elife.76487. URL https://doi.org/10.7554/elife.76487.

[3] Andrea Brizzi, Charles Whittaker, Luciana M. S. Servo, Iwona Hawryluk, Carlos A. Prete, William M. de Souza, Renato S. Aguiar, Leonardo J. T. Araujo, Leonardo S. Bastos, Alexandra Blenkinsop, Lewis F. Buss, Darlan Candido, Marcia C. Castro, Silvia F. Costa, Julio Croda, Andreza Aruska de Souza Santos, Christopher Dye, Seth Flaxman, Paula L. C. Fonseca, Victor E. V. Geddes, Bernardo Gutierrez, Philippe Lemey, Anna S. Levin, Thomas Mellan, Diego M. Bonfim, Xenia Miscouridou, Swapnil Mishra, Mélodie Monod, Filipe R. R. Moreira, Bruce Nelson, Rafael H. M. Pereira, Otavio Ranzani, Ricardo P. Schnekenberg, Elizaveta Semenova, Raphael Sonabend, Renan P. Souza, Xiaoyue Xi, Ester C. Sabino, Nuno R. Faria, Samir Bhatt, and Oliver Ratmann. Spatial and temporal fluctuations in COVID-19 fatality rates in brazilian hospitals. *Nature Medicine*, 28(7):1476–1485, May 2022. doi: 10.1038/s41591-022-01807-1. URL https://doi.org/10.1038/s41591-022-01807-1.

[4] Andria Mousa, Peter Winskill, Oliver John Watson, Oliver Ratmann, Mélodie Monod, Marco Ajelli, Aldiouma Diallo, Peter J Dodd, Carlos G Grijalva, Moses Chapa Kiti, Anand Krishnan, Rakesh Kumar, Supriya Kumar, Kin O Kwok, Claudio F Lanata, Olivier Le Polain de Waroux, Kathy Leung, Wiriya Mahikul, Alessia Melegaro, Carl D Morrow, Joël Mossong, Eleanor FG Neal, D James Nokes, Wirichada Pan-ngum, Gail E Potter, Fiona M Russell, Siddhartha Saha, Jonathan D Sugimoto, Wan In Wei, Robin R Wood, Joseph Wu, Juanjuan Zhang, Patrick Walker, and Charles Whittaker. Social contact patterns and implications for infectious disease transmission – a systematic review and meta-analysis of contact surveys. *eLife*, 10, November 2021. doi: 10.7554/elife.70294. URL https://doi.org/10.7554/elife.70294.

[5] Swapnil Mishra, James A. Scott, Daniel J. Laydon, Seth Flaxman, Axel Gandy, Thomas A. Mellan, H. Juliette T. Unwin, Michaela Vollmer, Helen Coupland, Oliver Ratmann, Melodie Monod, Harrison H. Zhu, Anne Cori, Katy A. M. Gaythorpe, Lilith K. Whittles, Charles Whittaker, Christl A. Donnelly, Neil M. Ferguson, and Samir Bhatt. Comparing the responses of the UK, sweden and denmark to COVID-19 using counterfactual modelling. *Scientific Reports*, 11(1), August 2021. doi: 10.1038/s41598-021-95699-9. URL https://doi.org/10.1038/s41598-021-95699-9.

[6] H. Juliette T. Unwin, Swapnil Mishra, Valerie C. Bradley, Axel Gandy, Thomas A. Mellan, Helen Coupland, Jonathan Ish-Horowicz, Michaela A. C. Vollmer, Charles Whittaker, Sarah L. Filippi, Xiaoyue Xi, Mélodie Monod, Oliver Ratmann, Michael Hutchinson, Fabian Valka, Harrison Zhu, Iwona Hawryluk, Philip Milton, Kylie E. C. Ainslie, Marc Baguelin, Adhiratha Boonyasiri, Nick F. Brazeau, Lorenzo Cattarino, Zulma Cucunuba, Gina Cuomo-Dannenburg, Ilaria Dorigatti, Oliver D. Eales, Jeffrey W. Eaton, Sabine L. van Elsland, Richard G. FitzJohn, Katy A. M. Gaythorpe, William Green, Wes Hinsley, Benjamin Jeffrey, Edward Knock, Daniel J. Laydon, John Lees, Gemma Nedjati-Gilani, Pierre Nouvellet, Lucy Okell, Kris V. Parag, Igor Siveroni, Hayley A. Thompson, Patrick Walker, Caroline E. Walters, Oliver J. Watson, Lilith K. Whittles, Azra C. Ghani, Neil M. Ferguson,

Steven Riley, Christl A. Donnelly, Samir Bhatt, and Seth Flaxman. State-level tracking of COVID-19 in the united states. *Nature Communications*, 11(1), December 2020. doi: 10.1038/s41467-020-19652-6. URL https://doi.org/10.1038/s41467-020-19652-6.

[7] Nuno R. Faria, Thomas A. Mellan, Charles Whittaker, Ingra M. Claro, Darlan da S. Candido, Swapnil Mishra, Myuki A. E. Crispim, Flavia C. S. Sales, Iwona Hawryluk, John T. McCrone, Ruben J. G. Hulswit, Lucas A. M. Franco, Mariana S. Ramundo, Jaqueline G. de Jesus, Pamela S. Andrade, Thais M. Coletti, Giulia M. Ferreira, Camila A. M. Silva, Erika R. Manuli, Rafael H. M. Pereira, Pedro S. Peixoto, Moritz U. G. Kraemer, Nelson Gaburo, Cecilia da C. Camilo, Henrique Hoeltgebaum, William M. Souza, Esmenia C. Rocha, Leandro M. de Souza, Mariana C. de Pinho, Leonardo J. T. Araujo, Frederico S. V. Malta, Aline B. de Lima, Joice do P. Silva, Danielle A. G. Zauli, Alessandro C. de S. Ferreira, Ricardo P. Schnekenberg, Daniel J. Laydon, Patrick G. T. Walker, Hannah M. Schlüter, Ana L. P. dos Santos, Maria S. Vidal, Valentina S. Del Caro, Rosinaldo M. F. Filho, Helem M. dos Santos, Renato S. Aguiar, José L. Proença-Modena, Bruce Nelson, James A. Hay, Mélodie Monod, Xenia Miscouridou, Helen Coupland, Raphael Sonabend, Michaela Vollmer, Axel Gandy, Carlos A. Prete, Vitor H. Nascimento, Marc A. Suchard, Thomas A. Bowden, Sergei L. K. Pond, Chieh-Hsi Wu, Oliver Ratmann, Neil M. Ferguson, Christopher Dye, Nick J. Loman, Philippe Lemey, Andrew Rambaut, Nelson A. Fraiji, Maria do P. S. S. Carvalho, Oliver G. Pybus, Seth Flaxman, Samir Bhatt, and Ester C. Sabino. Genomics and epidemiology of the p.1 SARS-CoV-2 lineage in manaus, brazil. *Science*, 372(6544):815–821, May 2021. doi: 10.1126/science.abh2644. URL https://doi.org/10.1126/science.abh2644.