

Zia Farooq, PhD *Epidemiological Modeller/ Data scientist*

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🏠 Google scholar 📅 17 Aug 1986

🎓 Academic Qualifications

PhD in Epidemiology and Public Health, Umeå University ☑

Feb 2020 – Jun 2024 | Umeå, Sweden

Thesis title: *Navigating epidemics by leveraging data science and data-driven modelling*

Masters in Applied Mathematics,

Institute of Space Technology Islamabad ☑

2015 – 2017 | Islamabad, Pakistan

Nonlinear dynamical systems and bifurcation theory

Bachelors in Mathematics, University of Gujrat,

2007 – 2009 | Gujrat, Pakistan

🔧 Current and Previous Positions

Postdoctoral Researcher ☑, Umeå University

Aug 2024 – present | Umeå, Sweden

Modelling, analysis, and risk indicator development of infectious diseases in the EU-funded IDAlert project.

Early Career Researcher, Polish Academy of Sciences

Aug 2018 – Dec 2019 | Warsaw, Poland

🔧 Research Experience/Skills

Data science | Modelling | Epidemiology | Biostatistics

Umeå, Sweden

- Working as a climate and health data scientist
- Big data wrangling, processing, merging, analysis, and visualization
- Developing advanced mathematical modelling techniques to simulate, assess, and predict the risk of infectious diseases
- Using machine learning and explainable AI to disentangle the drivers of emerging infectious diseases.
- Using biostatistics and epidemiological methods in disease modelling
- Developing European-level indicators for West Nile virus (WNV) disease for the Lancet Countdown -Europe

🔧 Registry-based Cancer Epidemiology

Celiac-Colorectal cancer (CRC) cohort study ☑,

Swedish Registered-based data

2022 | Umeå

Independently led and successfully completed time-to-event analysis of colorectal cancer risk in 36,668 Swedish celiac patients vs. matched controls (Cox PH, Schoenfeld residuals, time-stratified HRs; R).

📖 Research Publications

Northward expansion of *Aedes albopictus*-associated arbovirus transmission risk in Europe ☑,

The Lancet Planetary Health, 101378, 05 Nov 2025

Zia Farooq, Joacim Rocklöv, Jan C Semenza

Impact of climate and *Aedes albopictus* establishment on dengue and chikungunya outbreaks in Europe: a time-to-event analysis ☑, *The Lancet Planetary Health*,

Volume 9, Issue 5e374-e383May 2025

Zia Farooq, Leo Segelmark, Joacim Rocklöv, Kate

Lillepold, Maquines Odhiambo Sewe, Olivier J.T. Briete,

Jan C. Semenza,

Improving estimates of case fatality ratios early in pandemics by accounting for case-to-death times distribution analysis ☑,

Scientific Reports, Volume 15, Issue 1, Pages 5402, Feb 2025

Zia Farooq, Henrik Sjödin, Joacim Rocklöv, Åke

Bränström

Navigating epidemics by leveraging data science and data-driven modelling ☑,

Umeå University (PhD thesis), May 2024

Zia Farooq

Input precision, output excellence: the importance of data quality control and method selection in disease risk mapping —authors' reply ☑,

Lancet Regional Health-Europe, Vol 42, 100947, Jul 2024

Zia Farooq, Joacim Rocklöv, Jonas Wallin, Najmeh Abiri, Maquines Odhiambo Sewe, Henrik Sjödin, Jan C Semenza

The 2024 Europe report of the Lancet Countdown on health and climate change: unprecedented warming demands unprecedented action ☑,

Lancet Public Health, 12 May 2024

Kim R van Daalen, Cathryn Tonne, Jan Semenza,..., **Zia Farooq**, ... Rachel Lowe

Decision-support tools to build climate resilience against emerging infectious diseases in Europe and beyond ☑,

Lancet Regional Health-Europe, Vol 32, 100701, Sep 2024

Joacim Rocklöv, Jonas Wallin, Najmeh Abiri, Maquines Odhiambo Sewe, Henrik Sjödin, Jan C Semenza

European projections of West Nile virus transmission under climate change scenarios ☑,

One Health, Vol 16, 100509, Feb 2023

Zia Farooq, Henrik Sjödin, Jan C Semenza, Jonas Wallin, Yesim Tozan, Maquines Sewe, Joacim Rocklöv

Biological Data Analysis

Biochemical signaling for more efficient therapeutic strategies,
Institute of Fundamental Technological Research, Polish Academy of Sciences
2018 – 2019 | Warsaw, Poland

Extensive experience in handling and analyzing large biological datasets from wet lab experiments, including generating response curves for Type-I interferons and describing the levels of phosphorylated STATs (pSTATs) in the nuclei of both cell types used in experiments, BJ and HME cells, stimulated with four variants of Type-I interferons.

Conferences/Seminars

Nobel Petite Day 10 Dec 2025, Presenter:
Dec 2025 | Umeå University | Sweden

Dealing with the polycrisis - UTRI, Session Coordinator and presenter
Nov 2025 | Umeå University | Sweden

Modelling Dengue Importations from Endemic to Non-Endemic Regions: Influence of Human Mobility and Climate Variability,
Research seminar
May 2025, Trento | Italy
Modelli matematici di epidemie – Laboratorio EPIMAT, Dipartimento – Matematica, Trento University, Italy

Data and Model-driven Early Warnings to Tackle Infectious Diseases
Nov 2024 | Umeå, Sweden
Young Researcher talk on the Department Day

Conference on "Urban spaces and mosquitoes on a changing planet" 
, Oral presentation: European projections of West Nile virus under climate change scenarios
Mar 2023 | Barcelona, Spain

Connecting Health and Climate Change
Oct 2023 | Stockholm, Sweden
Oral presentation: "Climate change and West Nile virus risk in Europe"

European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE), 2023
Nov 2023 | Barcelona, Spain
Poster presentation

European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE), 2022 , Participant
Nov 2022 | Stockholm, Sweden

Polish Scientific Network (PSN) conference ,
Oral presentation: Climate change and pandemic risk
Sep 2022 | Wrocław University, Poland

Seminar on "One Health PACT modelling", Invited talk
Jul 2022 | Leiden University, Netherlands

Seminar on "Mathematical modelling and its applications", Keynote Speaker
Jun 2022 | University of Gujrat | Digital, Pakistan

2nd Nordic Biomathematics conference , *Poster presentation*
May 2022 | Roskilde University, Denmark

Swedish Medical Association conference ,
Poster presentation: Case fatality ratio
Dec 2020 | Digital, Sweden

The 2022 Europe Report of the Lancet Countdown on Health and Climate Change: towards a more climate resilient future ,
Lancet Public Health, Vol 7, E942-E965, Oct 2022
Kim Robin van Daalen, Marina Romanello, Joacim Rocklöv, ..., **Zia Farooq**, ..., Rachel Lowe

Artificial intelligence to predict West Nile virus outbreaks with eco-climatic drivers ,
Lancet Regional Health-Europe, Vol 17, 100370, Mar 2022
Zia Farooq , Joacim Rocklöv, Jonas Wallin, Najmeh Abiri, Maquines Sewe, Henrik Sjödin, Jan C Semenza

COVID-19 healthcare demand and mortality in Sweden in response to non-pharmaceutical mitigation and suppression scenarios ,
International Journal of Epidemiology, Vol 49, Sep 2020
Henrik Sjödin, Andres F Johansson, Åke Bränström, **Zia Farooq**, ..., Joacim Rocklöv

Only strict quarantine measures can curb the coronavirus disease (COVID-19) outbreak in Italy, 2020 , *Eurosurveillance, Vol 25, Issue 13, April 2020*
Henrik Sjödin, Annelies Wilder-Smith, Sarah Osman, **Zia Farooq**, Joacim Rocklöv

Information processing in unregulated and autoregulated gene expression , *European control conference (ECC), Saint Petersburg, Russia, May 2020*
Zahra Vahdat, Karol Nienaltowski, **Zia Farooq**, Michal Komorowski, Abhyudi Singh

Bifurcation analysis of heartbeat model ,
Journal of Space Technology, July 2017
Zia Farooq, Salman Ahmed

Human mobility and climate change are escalating the transcontinental threat of dengue., Manuscript
Zia Farooq, Jan C Semenza, Joacim Rocklöv, Pratik Singh, Henrik Sjödin

Training/ Teaching

Teaching of courses, Masters Level
2022 – 2025 | Umeå University, Sweden

- Modelling and Simulations
- Epidemiology
- Climate Change and Health

DevRes2021 Conference Umeå University, Technical Intern
Jun 2021 | Umeå University, Sweden

Member steering committee, Young researchers network, UTRI
Dec 2020 – Dec 2021 | Umeå University, Sweden

Reviewing Activities

Since 2021
Environmental Health Perspectives, PLOS Climate, Scientific Reports, Vaccines, PLOS Computational Biology, Lancet Reginal Health-Europe

Technical Skills

Programming

R, MATLAB, SPSS, Python, Stata, shell scripting

Machine Learning / AI/ Biostatistics

Classification, Regression, Clustering, PCA, eXplainable AI, Boosting and Bagging, Survival Analysis, Hypothesis testing, Neural networks, Multivariate analysis,

Data Science

Data wrangling, extraction, cleaning, and engineering,
<https://faruk-xia.quarto.pub/> 

Collaboration/ virtual communication

Github, Google Docs, Zoom, Teams,

Courses

Mosquito-borne pathogens and their vectors

2022 | Umeå University, Umeå, Sweden

Regression models in medical science

2021 | Umeå University, Umeå, Sweden

Research methodology with biostatistics

2021 | Umeå University, Umeå, Sweden

Writing Science

2021 | Umeå University, Sweden

Bayesian Statistics

2019 | University of Warsaw, Warsaw, Poland

Programming, Numerics and Optimization

2019 | IFTR, Polish Academy of Sciences, Warsaw, Poland

Python programming for biologists

2019 | NIEB, Polish Academy of Sciences, Warsaw, Poland

Nonlinear Dynamics and Chaos

2015 – 2016 | Institute of Space Technology, Islamabad, Pakistan

Personal Website/ Data science projects

Data science projects

<https://faruk-xia.quarto.pub/> 

Research visits for internationalization

Research collaboration and networking

May 2025 | Trento, Italy

Applied Ecology Unit, Research and Innovation Centre,
Fondazione Edmund Mach, Trento, Italy

Grants/Awards

2021 – 2025

- Kempe Foundation two-year Postdoctoral Scholarship
- MIRAI Japanese-Swedish long-term mobility grant for Early-Career Researchers (ECR): 130,000 SEK
- Travel Grant for Research visit: SEK 18500/-
- Umeå University, Medical Faculty Grant for Internationalization: SEK 28500

Supervision

- Co-supervisor: PhD scholar at University of Management and Technology, Lahore, Pakistan, 2024-
- Supervisor: Master's student at Umeå University, Sweden, 2025