SHAZIA RUYBAL-PESÁNTEZ

Genomic Epidemiologist (PhD) | MRC Centre for Global Infectious Disease Analysis, Imperial College London

I am a genomic epidemiologist with expertise in population genetics, bioinformatics, and epidemiology of infectious diseases, particularly malaria. I am based at Imperial College London and am an Adjunct Associate Professor at Universidad San Francisco de Quito in Ecuador. For a list of my publications, see Google Scholar.

🎓 QUALIFICATIONS

2018

The University of Melbourne
PhD in Genetic Epidemiology
📍 Melbourne, Australia

2012

The Colorado College
BA in Biology
📍 Colorado Springs, CO, USA

💻 SELECTED RESEARCH EXPERIENCE

2022 | Present

Research Associate, Dept of Infectious Disease Epidemiology
MRC GIDA, Imperial College London
📍 London, UK

- Developing novel methods and computational tools to analyse genomic data to support malaria molecular surveillance. *My projects include:*
- ○ **SIMPLEGEN** R package to simulate malaria genetic epi to explore the "power" of genomic surveillance sampling designs
- ○ **DRpower** Shiny app (not yet public) to simplify the design of studies that monitor rapid diagnostic tests effectiveness for malaria diagnosis in the field
- 🔧 Skills used: R, RMarkdown, Github, Shiny, Quarto, Python

2021 | 2022

Visiting Scientist, Institute of Microbiology
Universidad San Francisco de Quito
📍 Quito, Ecuador

- Support the coordination and data analysis (ongoing) of a cohort study to understand vaccine and infection–induced immunity to SARS–CoV–2
- Support data analysis (ongoing) on the genomic epidemiology and phylogenetics of SARS–CoV–2 in Ecuador
- 🔧 Skills used: REDCap, R, RMarkdown, Github, HPC/SLURM

2020

Consultant Epidemiologist
Freelance
📍 Quito, Ecuador

- Consulted for the Ministry of Foreign Affairs and Migration & National COVID-19 Emergency Response Committee providing internal analyses on case/testing trends and epi modelling (importation dynamics, *Reff*)
- Consulted for the Ecuadorian Red Cross National Blood Bank to establish SARS-CoV-2 sero-surveillance as part of the COVID-19 emergency response, delivered a surveillance `flexdashboard` (not public)
- 🔧 Skills used: R, RMarkdown, Github, Dashboards

2019 | 2022

Research Associate, Population Health and Immunity Division
Walter & Eliza Hall Institute of Medical Research
📍 Melbourne, Australia

- Supported field implementation and lead the overall analysis (ongoing) of a 12–month longitudinal cohort study in Papua New Guinea
- Work involved `flexdashboard` for routine updates and data viz of both operational logistics aspects and real-time epidemiological trends
- Worked with large epidemiological datasets from a range of malaria, vector-borne diseases, and COVID-19 projects and led the data curation, management and analysis using reproducible workflows
- 🔧 Skills used: Applied epi, R, RMarkdown, Github/Gitlab, Dashboards, Shiny

CONTACT INFO

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- ○ github.com/shaziaruybal
- 🌐 shaziaruybal.com
- 🐦 @DrShaziaRuybal

I am an experienced `R` user for data processing, vizualization, communication, reports/dashboards, shiny apps, workshop development/organization and am passionate about open science and the development of digital tools for research. See below for more details.

SKILLS

📈 Full experience in genetic/genomic sequencing data analysis, population genetic and epidemiological methods, database curation/management, and reproducible research workflows

🖥 Expert in R (tidyverse), RStudio, RMarkdown, Shiny, SLURM/HPC

🖥 Experienced in Git/Github, LaTeX, CSS, HTML, Quarto, Python, REDCap

LANGUAGES

Native speaker English and Spanish
French Level A2
Dutch Level A1

ADDITIONAL TRAINING

2021: Short course: Multiple imputation in `R` (Victorian Centre for Biostatistics)
2021: Diversity Scholar Workshop (RStudio)
2018: Certification "Teaching Skills for Graduate Researchers (University of Melbourne)
2017: Winter School in Mathematical Biology (The University of Queensland)
2015: Short course: Spatial mapping and GIS `R` skills (University of Melbourne)

2014 | 2019

PhD Researcher/Research Associate, Bio21 Institute
University of Melbourne
📍 Melbourne, Australia

- Applied genomic epidemiology approaches (bioinformatic and population genetic methods) using `R` to better understand the malaria transmission dynamics in Ecuador and Ghana
- 🔧 Skills used: Applied epi, R, RMarkdown, Github, Data management/curation

💼 POSITIONS

2022-Present
Research Associate, *Imperial College London*

2020-Present
Adjunct Associate Professor, *Universidad San Francisco de Quito*

2019-Present
Research Fellow (now Honorary), *University of Melbourne, Walter and Eliza Hall Institute of Medical Research*

2019-2022
Honorary Research Fellow, *Burnet Institute, Australian Centre for Research Excellence in Malaria Research and Centre for the Elimination of Neglected Tropical Diseases*

2012-2014
Research Assistant, *New York University School of Medicine*

💻 SELECTED TEACHING EXPERIENCE

2019-2022
R-Ladies Melbourne Inc
Registered female-led charity, >2300 members
📍 Melbourne, Australia

- Leadership roles (Secretary, President) organising monthly meetups ranging from beginner to advanced `R` topics. See sidebar for workshops I have (co-)led

2019-Present
Guest lecturer
📍 Ecuador/Australia

- 2019: Nossal Institute for Global Health MPH on Malaria and Child Health
- 2021: Universidad San Francisco de Quito MSc Innovation on COVID–19 epidemiology, variant dynamics and implications for public health in Ecuador

2016-Present
Student supervision
University of Melbourne

- Supervised/mentored students to completion in honors/undergrad (3), MSc (1) and PhD (3, 2 ongoing) with projects in population genetics, seroepidemiology, and computational biology. I serve on 3 PhD committees at UoM
- Actively involved in the supervision, mentorship and capacity–building of researcher officers/technical staff in Papua New Guinea and Ecuador

🏅 NOTABLE AWARDS

Apr 2021
COVID-19 Digital Grant (Regional Collaborations Programme)
Australian Academy of Sciences & Dept of Industry, Science, Energy and Resources
📍 Melbourne, Australia

- Awarded A$10,000 as Chief Investigator for the collaborative project: Fit–for–purpose analytical tools to support COVID–19 sero–surveillance in Papua New Guinea. This led to the development of `covidClassifyR`

Dec 2019
Kellaway Excellence Award in Education
Walter and Eliza Hall Institute of Medical Research
📍 Melbourne, Australia

- Awarded to recognize the significant contribution to improve female representation in statistical bioinformatics through joint leadership of R–Ladies Melbourne, the R programming community for women in Australia

DIGITAL TOOLS

`SIMPLEGEN`: R package to simulate malaria genetic epidemiology

`CovidClassifyR`: Shiny app to process and analyse COVID-19 serological data. See my ▶ useR! 2022 presentation

`CovidVaccinationScore`: Shiny app to help individuals better understand their "priority" status during vaccine roll-out in Ecuador

Ecuador blood bank COVID-19 sero-surveillance `flexdashboard` (not open-source): presented anonymized/aggregated SARS-COV-2 seroprevalence data from monthly screening of blood donation samples

ICEMR PNG weekly `flexdashboard` (not open-source): presented operational data (e.g. follow-up rates) for study team to plan field activities, as well as prelim epi trends (e.g. malaria test positivity)

WORKSHOPS

Crea tu dashboard en `R`: Visualizando datos del mundial FIFA (Oct 2022): Presented at Brown Bag Seminar InnovaLab at Institute of Tropical Medicine/University Cayetano Heredia Peru (in Spanish) for the MSc program

Applied Malaria Molecular Surveillance workshop (Aug 2022): Co-organized 4–day workshop for African researchers on how to use `R`-based data analysis tools for malaria genomics

Shiny app `covidClassifyR` workshop (March 2022): Led 4–day virtual workshop for researchers in Papua New Guinea on how to use `covidClassifyR`

Automate your CV in `rmarkdown`: easy as 1, 2, `knit`! (Feb 2022): Presented at R-Ladies Melbourne meetup, the ▶ recording has been viewed >5600 times

STEM Workshop "Solve an outbreak and become a disease detective" (Sep 2019 & 2022): Co-led workshop at "It Takes a Spark" Conference teaching young girls (Y7-12) epidemiology and `R` skills (materials)

Made with pagedown, source code

See more detailed CV here

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