SOPHIE MEI LIN WHIKEHART, MPH

+1 (812) 345-6096 | smwhikehart@gmail.com | Seattle, WA | LinkedIn

EXPERIENCE

INSTITUTE FOR HEALTH METRICS AND EVALUATION, Volunteer & MPH Thesis Contributor June 2024 – March 2025

Supervisors: Dr. Hmwe Hmwe Kyu, MBBS, MPH and Dr. Peng Zheng

- Conducted a **systematic review and quantitative meta-analysis** to identify relevant studies on the long-term impact of diarrheal pathogen infections (*Shigella spp., Campylobacter spp., Enterotoxigenic E. coli, Enteropathogenic E. coli, Norovirus, Cryptosporidium spp., Rotavirus and Adenovirus)* on childhood growth metrics such as height-for-age Z scores (HAZ), weight-for-age Z scores (WAZ) and weight-for-height Z scores (WHZ).
- Performed the **meta-analysis using R `metafor` package**, considering the different biases associated with each data source to **produce summary effect sizes** per pathogen-specific diarrhea episode on growth metrics and **creation of forest plots**.
- Ran Ti/Ab and full-text screening with semi-automated methods in DistillerSR.
- **Extracted data** from full-text articles using the IHME GBD extraction template to capture relevant data (ex – study design, population, crude effect size, standard error).
- Contributed to a **manuscript** on summary outcomes from this systematic review and meta-analysis.

UNIVERSITY OF WASHINGTON SCHOOL OF MEDICINE, Graduate Research Assistant & MPH Practicum May 2024 – March 2025

Supervisor: Tijana Milinic, MD

- Aided with **semi-structured in-depth interviews** with racial and ethnic minority patients with cystic fibrosis (CF) to explore perceptions of individual, social and structural barriers of participation in CF clinical trials.
- Built and managed **administrative tasks** of online databases and surveys using **REDCap** as well as scheduling, booking and organizing interviews for PI.
- Contributed to the interview guide, attendance of steering committee meetings with CF Community Voice for feedback of project.
- Created a **qualitative codebook** using both inductive and deductive coding with Dedoose software.
- Performed **thematic data analysis** using a systematic and iterative context analysis that is both theory-driven and inductive to identify new themes not previously considered.

SEATTLE CHILDREN'S RESEARCH INSTITUTE, Research Technician I July 2022 – September 2023

Supervisors: Dr. Murat Ali Maga and Dr. Sara Rolfe

- Worked with KOMP2 genetic knockout strains for **performance validation**, **manual clean-up** and **update of training set** for MEMOS a **deep learning model** previously trained from ABM (Atlas Based Methods) that uses Fully Convolutional Neural Networks (FCNNs) as well as PyTorch and MONAI (Medical Open Network for Artificial Intelligence) libraries for **quantitative multi-organ segmentation** of mice embryos.
- Aided in wet lab **micro-CT** (computed tomography) scanning for mice embryos, **iodine contrast staining** and **hydrogel-tissue hybridization protocol** that produced high resolution information from a complex biological system that is fully assembled but optically transparent and macromolecule-permeable.
- Navigated **Linux** command line interface and environment.
- Helped to **identify candidate genes** associated with developmental asymmetry and to validate these candidates, perform an **association study** using existing WGS (whole genome sequencing) data comparing two different ethnic cohorts with orofacial cleft (OFC) risk to control populations.
- Aimed to learn how **genotype imputation** especially for rare variants can be employed on more diverse populations and gain a better understanding of complex linkage disequilibrium structures.

SEATTLE CHILDREN'S RESEARCH INSTITUTE, Undergraduate Student Research Volunteer February 2022 – July 2022

Supervisors: Dr. Murat Ali Maga and Dr. Sara Rolfe

- Gained proficiency with **SlicerMorph**, a biomedical and computational analysis ecosystem with **visualization** and **segmentation** capabilities built onto a **python scriptable** open-source library.
- Created a **literature review on statistical shape models (SSMs)** and how SSMs can be applied to computational anatomy, geometric morphometric shape analysis, digital medical research, surgical/therapy planning, computer aided diagnosis, and other potential automated methods.

SKILLS

Languages & Tools: R, RMarkdown, Python, Java, HTML/CSS, LaTeX, Jupyter, Git/GitHub and Microsoft Office

Biostatistics:

- Descriptive statistics, parametric & nonparametric methods
- Sample description, comparison of means and proportions
- Simple and multiple linear regression, ANOVA and ANCOVA
- Logistic regression
- Outlier detection, transformations, dummy variables, variable selection

Machine Learning:

- High-dimensional regression, classification, clustering, dimension reduction
- Supervised and unsupervised learning, bias-variance tradeoff
- Hyperparameter tuning to minimize generalization error
- Applications in R: Lasso & ridge regression, splines, GLMs, trees and bootstrap, neural networks

Epidemiology:

- Disease frequency, study design, measures of risk, casual inference
- Screening, measurement error, misclassification, effect modification, confounding

Global & Public Health:

- Social, political and economic determinants of health
- Policy formulation, gap analysis, pharmaceutical policy, budget creation
- Global burden of disease (GBD), mortality rates, DALYs
- Literature review, intervention design, community engagement
- Needs assessment, monitoring & evaluation, health behavior theories, ecological perspectives, systems diagrams, conceptual models, community based participatory research

Qualitative Research:

- Thematic analysis and qualitative codebook creation
- Data collection, transcript study, interview guide design
- Mixed-methods study design & integration

Data Management & Research Tools

- RedCAP, Epic Systems, DistillerSR, Dedoose, Zotero
- Data cleaning, wrangling, analysis, reproducible research

Geospatial & Imaging Analysis: QGIS, ArcGIS, SlicerMoprh

Biological Methods: qPCR, serial dilutions, DNA extraction, agarose gel electrophoresis

EDUCATION

University of Washington, Seattle, WA — September 2023 – March 2025
Master of Public Health, Department of Global Health
GPA: 3.79

University of Washington, Seattle WA — September 2019 – June 2022
Bachelor of Arts, Major: Human Evolutionary Biology & Medical Anthropology & Global Health, **Minor:** Data Science
GPA: 3.75
Study Abroad: Anthropology Việt Nam: Paleolithic Archeology Field School — June 2022 – August 2022
Academic Standing: Awarded Dean's List in 6 academic quarters

PUBLICATIONS

Morphological Simulation Tests the Limits on Phenotype Discovery in 3D Image Analysis — July 2024
Authors: Rachel A. Roston, Sophie M. Whikehart, Sara M. Rolfe, Murat Maga
bioRxiv 2024.06.30.601430
doi: https://doi.org/10.1101/2024.06.30.601430

Deep Learning Enable Multi-Organ Segmentation of Mouse Embryos — February 2023
Authors: Rolfe, S. M., Whikehart, S. M., & Maga, A. M.
Biol Open 15 February 2023; 12 (2): bio059698
doi: https://doi.org/10.1242/bio.059698ow