Nicole Anne Swartwood
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Harvard University
Department of Global Health and Population
90 Smith Street
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CURRENT POSITION

Harvard T.H. Chan School of Public Health   Boston, MA
Research Analyst

EDUCATION

Harvard Extension School   Boston, MA
Graduate certificate in Data Science   December 2022

Emory University   Atlanta, GA
Master of Science of Public Health, Environmental Health & Epidemiology   May 2017
Thesis: "Air Quality and Morbidity in Dhaka City, Bangladesh:
          an estimation of the contribution of brick kilns to air quality & their potential to affect human health"

University of Tennessee   Knoxville, TN
BS Mathematics,
Thesis: "Evaluation of the EPA AERMOD in Mountain Top Removal Coal Dust Dispersion"
BS Microbiology, Beta Beta Beta Honor Society
BA Honors History
BA Honors Religious Studies
Dual Thesis in History/Religious Studies: "Forming the Molds: The Institutum Judaicum's Utilization of Judeo-German in the 18th Century Judenmission"
BA German Studies, Delta Phi Alpha

University of Pittsburgh & Prolog Language School   Pittsburgh, PA / Krakow, Poland
Summer Language Institute for Intensive Polish   Summer 2011, 2013

EMPLOYMENT

Harvard University   Boston, MA
Research Analyst, PI Nicolas Menzies   October 2017 - Present
Develop and program deterministic mathematic models of tuberculosis disease dynamics.
- Responsible for the programming and troubleshooting of Bayesian disease models in R and C++; model design optimized for integration into a R Shiny App.
- Developed and maintained online webtool, Tabby2, for real-time, state-level estimates of tuberculosis epidemiology and economic analyses. Tool here: https://ppmltools.org/tabby2/
- Worked to develop and troubleshoot COVID-19 nowcasting site for U.S. states and counties. Site here: https://covidestim.org
- Developed economic methodology for evaluating the cost effectiveness of tuberculosis interventions in the United States; currently finalizing an R package to automate these calculations.
- Collaborate regularly with CDC Division of TB elimination and Office of Health Equity, local departments of health, and CDC Botswana team to accomplish research objectives.
- Develop various dissemination methods, including scientific manuscripts, conference presentations, and one-on-one trainings of stakeholders.

Co-founder and organizer, R User Group   June 2021 – present
- Arrange for R developers to discuss novel projects and methods with our organization.

- Lead tutorials on specific interest topics, such as GitHub for R or data cleaning methods.
- YouTube of our sessions here: https://www.youtube.com/@rusergroupatharvarddatasci7232

Emory University   Atlanta, GA
Graduate Researcher, PI Eri Saikawa   August 2016 – May 2017
- Developed method and completed calculations of estimations of brick kiln emissions to particulate matter concentrations in India, Nepal, and Bangladesh. Drafting a chapter for World Bank publication.
- Used Weather Research and Forecasting model coupled with Chemistry (WRF-Chem) to create spatial, temporal models simulating the contribution of brick kiln emissions to air quality concentrations in Bangladesh.

Graduate Research Assistant, PI Juan Leon   October 2015-May 2017
- Quantified GI and GII norovirus in produce wash samples through individual qPCR within an 8-person lab group.
- Conducted systemic review in search of indicators for norovirus and Hepatitis A in an agricultural setting.
- Prepared of NIH R01 grant materials, with focus on investigator bio-sketches and budget materials.
- Optimized protocol for qPCR quantification of Hepatitis A from environmental samples.
- Designed experiments to determine protocol for the use of Turnip Crinkle Virus as a process control for Norovirus qPCR quantification.
- Reviewed and revised previously developed quantitative microbial risk model (qmra) for Norovirus transmission on farms. Edited R code, checked mathematical reasoning and assumptions, drafted manuscript for publication.

Georgia Institute of Technology   Atlanta, GA
Graduate Research Assistant, PI Nisha Botchway   October 2016-May 2017
- Identified potential research questions from existing dataset on environmental conditions, demographics, and livability in relation to health outcomes in Fulton County, Atlanta.
- Aided in the creation of an online visualization platform of the health, socio-demographic, and environmental characteristics in Fulton County, Georgia. Performed user testing and feedback.
- Worked within a ten person inter-institutional team to complete data analysis, manuscript composition, and presentation of findings.

American Cancer Society   Atlanta, GA
Public Health Intern   September 2016-Jaunary 2017
- Conducted large-scale literature review of over 20,000 articles to inform colorectal cancer screening recommendations.

Environment and Population Research Centre   Dhaka, Bangladesh
Researcher, Advisor Dr. Bilqis Amin Hoque   May-July 2016
- Developed and implemented pilot study for air pollution and tuberculosis incidence.
- Designed epidemiological study to explore associations between ambient air pollution exposure and tuberculosis incidence, including literature review, survey development, case interview questionnaires, and training of survey administrators.
- Consulted and performed data analysis of evaluation of Community Led Total Sanitation program in 64 wards in Bangladesh.
- Completed data cleaning and analysis in SAS.

University of Tennessee   Knoxville, TN
Field Supervisor, PI Erin Darby and Robert Darby,   2013- Present
- 'Ayn Gharandal Archaeological Project
- Collected samples of calcium carbonate deposits from bathhouse. These samples to be analyzed for mineral evidence of water pollution from a mine site in a neighboring wadi.

Undergraduate Research Assistant, PI Judy Day   January-May 2014
- Built an agent-based model to investigate the process of inhalation anthrax lethality.
- Learned new NETLOGO language through self-study

TEACHING EXPERIENCE

Emory University
Teaching Assistant, EPI 570. Infectious Disease Dynamics: Theory and Methods

PAPERS

Swartwood NA, Testa C, Cohen T, Marks SM, Hill AN, Cochran J, Cranston K, Randall LM, Tibbs A, Salomon JA, Menzies NA. Tabby2: A User-Friendly Web Tool for Forecasting State-Level TB Outcomes in the United States. Accepted at BMC Medicine 2023. Awaiting print.

Swartwood NA, Testa C, Cohen T, Marks SM, Hill AN, Cochran J, Cranston K, Randall LM, Tibbs A, Salomon JA, Menzies NA. The contribution of latent TB treatment to TB prevention in the United States: results of a transmission dynamic model. In final preparation.

Swartwood, NA, Li, Y, Reagan, M, Marks, SM, Barham, T, Beeler-Asay, GR, Cohen, T, Hill, AN, Horsburgh Jr, CR, Khan, AD, McCree, DH, Myles, R, Salomon, JA, Self, JL, Menzies, NA. Investigating the impact of closing disparities in TB incidence and case fatality rates across U.S.-born race-ethnicities in the United States. In final preparation.

Selected manuscripts as contributing author

Chitwood MH, Russi M, Gunasekera K, Havumaki J, Klaassen F, Pitzer VE, Salomon JA, **Swartwood NA**, Warren JL, Weinberger DM, Cohen T. Reconstructing the course of the COVID-19 epidemic over 2020 for US states and counties: Results of a Bayesian evidence synthesis model. PLoS Computational Biology. 2022 Aug 30;18(8):e1010465.

Klaassen F, Chitwood MH, Cohen T, Pitzer VE, Russi M, **Swartwood NA**, Salomon JA, Menzies NA. Population immunity to pre-Omicron and Omicron severe acute respiratory syndrome coronavirus 2 variants in US states and counties through 1 December 2021. Clinical Infectious Diseases. 2023 Feb 1;76(3):e350-9.

Menzies, N.A., **Swartwood, NA**., Testa, C., Malyuta, Y., Hill, A.N., Marks, S.M., Cohen, T. and Salomon, J.A., 2021. Time Since Infection and Risks of Future Disease for Individuals with Mycobacterium tuberculosis Infection in the United States. Epidemiology (Cambridge, Mass.), 32(1), p.70.

Menzies, NA, Bellerose, M, Testa, C, **Swartwood, NA**, Malyuta, Y, Cohen, T, Marks, SM, Hill, AN, Date, AA, Maloney, SA and Bowden, SE, 2020. Impact of Effective Global Tuberculosis Control on Health and Economic Outcomes in the United States. American Journal of Respiratory and Critical Care Medicine, (ja).

CONFERENCE PRESENTATIONS

Swartwood, NA, Li, Y, Reagan, M, Marks, SM, Barham, T, Beeler-Asay, GR, Cohen, T, Hill, AN, Horsburgh Jr, CR, Khan, AD, McCree, DH, Myles, R, Salomon, JA, Self, JL, Menzies, NA. Investigating the impact of closing disparities in TB incidence and case fatality rates across U.S.-born race-ethnicities in the United States. Oral abstract presentation at North American Regional Meeting of International Union for Tuberculosis and Lung Disease. February 23, 2023.

Swartwood, NA, Cohen, T, Marks, SM, Hill, AN, Beeler-Asay, GR, Horsburgh Jr, CR, Langer, A, Self, JL, Salomon, JA, Menzies, NA. Estimating the potential impact of the COVID-19 pandemic on future TB in the United States. Oral abstract presentation at the National Tuberculosis Conference. May 24, 2022.

Swartwood NA, Testa C, Cohen T, Marks SM, Hill AN, Cochran J, Cranston K, Randall LM, Tibbs A, Salomon JA, Menzies NA. The contribution of latent TB treatment to TB prevention in the United States: results of a transmission dynamic model. Poster presented at the main meeting of the International Union for Tuberculosis and Lung Disease. October 21, 2021.

Swartwood NA, Testa C, Cohen T, Marks SM, Hill AN, Cochran J, Cranston K, Randall LM, Tibbs A, Salomon JA, Menzies NA. Modeling the Population Effects of Testing & Treating for Latent TB in Clinically Recommended Populations. Poster presented at National TB Controllers Association meeting; October 2, 2020; Virtual.

Swartwood NA, Testa C, Cohen T, Marks SM, Hill AN, Cochran J, Cranston K, Randall LM, Tibbs A, Salomon JA, Menzies NA. MITUS (Modeling interventions for TB in the United States): a flexible framework for modelling TB epidemiology and policy efforts. Poster presented at National TB Controllers Association meeting; April 23-24, 2019; Atlanta, GA.

Testa C, **Swartwood NA**, Cohen T, Marks SM, Hill AN, Cochran J, Cranston K, Randall LM, Tibbs A, Salomon JA, Menzies NA. Tabby2: A user-friendly tool for comparing state-level B intervention options. Poster presented at National TB Controllers Association meeting; April 23-24, 2019; Atlanta, GA.

Swartwood NA. Water Pollution and Public Health: A Geochemical Study of 'Ayn Gharandal. Oral presentation given at the American Schools of Oriental Research meeting; November 2015. Atlanta, GA.

AWARDS
Best Poster Award for Tabby2: A user-friendly tool for comparing state-level B intervention options. Poster presented at National TB Controllers Association meeting; April 23-24, 2019; Atlanta, GA.
- One of five posters recognized out of 107 submissions.
National Institute of Occupational Safety and Health Trainee Grant recipient, 2015-2017
- One of three recipients for the 2017 MSPH cohort.

SKILLS
Familiar with R, Fortran, C++, Netlogo, JMP, SAS, STATA, and Microsoft Office Suite.
- Specialized R packages: EpiModel, GenABEL, Rcpp, & DPLYR
Covidence by Cochrane for systematic and literature review.
Intermediate proficiency in German and Polish; beginners proficiency in Hebrew.
Statistical analysis and mathematical modeling
Laboratory skills including PCR, Gel Electrophoresis, Stains, Serial Dilutions, Bacterial Transformations, Filter Extraction
and analysis, NMR, ICE and other skills.
Community outreach and education
Service organization and recruitment
Distance communication and remote committee coordination and management

RESEARCH INTERESTS
mathematical models, agent based models, tuberculosis, influenza, spatial models, respiratory disease and infection, infectious disease, air pollution, environmental sustainability, alternative energy, public health,

atmospheric chemistry, environmental epidemiology, climate change and health, energy and health, refugee health, ancient archaeology, history of public health, archaeological perspective on contemporary health issues.

RELEVANT COURSE WORK

Introduction to Microbiology
Introductory Microbiology Lab
Microbial Ecology, Honors
Advanced Microbiology Lab
Microbial Physiology
Microbial Pathogenesis
Virology
Introduction to Biochemistry I
Computing Techniques in Biochemistry & Related Fields
Organic Chemistry I & II
Organic Chemistry Lab
Numerical Algorithms
Probability and Statistics
Stochastic Processes
Mathematical Models in Biology, Honors
Introduction to Computer Science
Human Toxicology

Environmental Hazards I
Epidemiologic Methods I
Epidemiology of Respiratory Disease
Biostatistical Methods I
SAS Programming
Global Climate Change: Health Impacts and Response
Experimental Methods in Air Quality
Atmospheric Chemistry
Epidemiologic Methods II
Epidemiological Applications of Concepts
Biostatistical Methods II
Epidemiology of Tuberculosis
Field Trials and Intervention Studies
Geographic Information Systems
Epidemiologic Modeling
Advanced Environmental Epidemiology