Zhenan (Jacky) An

(404)-432-2130 • anzhenan0303@gmail.com • Atlanta, GA • Male

Research Interests: Computational Biostatistics, Machine Learning, Causal Inference, and Public Health Applications.

Educational Background

Emory University **Atlanta, GA**
Bachelor of Science (Honors Track), *08/2022 – 05/2026 (Expected)*
Double Major in Applied Mathematics and Statistics, Economics.
GPA: Overall 4.0/4.0; Math-only 4.0/4.0.
GRE: 168/ 170 Quantitative, 155 Verbal.
Notable Courses: Numerical Analysis, Probabilistic Machine Learning, Math of Data Science (Machine Learning & Deep Learning), Mathematical Statistics I & II, Parametric Statistics (Stochastic Process), Data Science Computing, Linear Algebra, Differential Equations, Foundations of Math (Mathematical Proofs), Econometrics, Honors Research.

Peer-Reviewed Publications

- Caroline Owens, **Zhenan An**, Craig Hadley. *"Discordant Experiences of Food Insecurity within Households in Cameroon: An Examination of Data from the 2018 Demographic and Health Surveys"*. *Public Health Nutrition*. (**Accepted**). DOI: 10.1017/S1368980025100578
- Zhiyuan Zheng, Shaojun Yu, Fumiko Chino, Farhad Islami, Jingxuan Zhao, Matthew P. Banegas, **Zhenan An**, Jing Zhang, K. Robin Yabroff. *"Cancer-Related Crowdfunding Economy in the United States"*. *Journal of the National Comprehensive Cancer Network*. (**Accepted, Forthcoming in Nov Issue**).
- **Zhenan An**, Priti Bandi, K. Robin Yabroff, Farhad Islami, Zhiyuan Zheng. *"Smoking Status and Productivity Loss among Working Age Cancer Survivors in the United States"*. *Journal of Clinical Oncology*. (**Under Review**; Poster accepted at 2025 ASCO Quality Care Symposium). Conference Abstract (Poster Presentation)
- Zhiyuan Zheng, **Zhenan An**, Paul Thienprayoon, Farhad Islami, Qinran Liu, K. Robin Yabroff. *"Food Prices, Food Insecurity, and its Implications for Public Health in the US"*. *Food Policy*. (**Under Review**).
- **Zhenan An**, Craig Hadley. *"The Association between Private Interviews and Sensitive Questions: Cross-National Evidence from 1.5+ Million Interviews"*. *Field Methods*. (**Under Review**).
- **Zhenan An**, Caroline Owens, Craig Hadley. *"Is Respondent Gender Associated with Household Food Insecurity? A Propensity Score Analysis of Food Security in Three Countries"*. (**Final Draft Completed**).

Research Experience

NLP and Survival Modeling in Cancer Survivorship Research **Atlanta, GA**
Research Intern, American Cancer Society (Supervisor: Dr. Zhiyuan "Jason" Zheng) *05/2024 - 09/2024*

- Developed an NLP pipeline to process 78K+ cancer-related GoFundMe campaigns with >90% validation accuracy against manual coding; identified systematic underreporting of clinical details and geographic/racial disparities in crowdfunding outcomes.
- Engineered end-to-end infrastructure for automated web scraping, classification, and neural network regression, enabling large-scale characterization of crowdfunding narratives; demonstrated the equal predictive power of socioeconomic factors (e.g., financial hardship, family burden) for campaign success as clinical need.
- Applied Cox proportional hazards and accelerated failure time models to NHIS survey data, showing elevated food prices disproportionately increase mortality burden among low-income and minority populations.
- Quantified productivity loss and reduced labor force participation among working-age cancer survivors, showing current smoking status as a significant predictor.

Causal Inference & Statistical Modeling of Health Inequality in LMICs **Atlanta, GA**
Research Assistant, Emory Dept. of Data and Decision Sciences (Advisor: Dr. Craig Hadley) *08/2023 - Present*

- Built machine learning and Bayesian classification workflows on 1.5M survey responses across 59 LMICs with improved prediction accuracy; addressed sample imbalance issue with propensity score matching (PSM) and SMOTE.
- Clustered 13K+ food insecurity surveys to uncover latent subgroups and frequent household-level reporting discordance.
- Estimated effects of interview privacy and respondent gender on reported food insecurity; sensitivity analyses (E-values) confirmed robustness to unmeasured confounding.

- Synthesized high-dimensional survey data into interpretable regression frameworks, enabling robust cross-country comparisons of household vulnerability and policy-relevant indicators.

Deep Learning Models for Influenza Forecasting **Atlanta, GA**
Research Assistant, Lau Lab at Emory, Rollins School of Public Health *05/2025 – Present*

- Developed baseline LSTM sequence models and physics-informed neural networks (PINNs) integrating mechanistic epidemic dynamics to forecast weekly U.S. influenza cases.
- Benchmarked deep learning forecasts with reduced RMSE and improved accuracy, improved predictive interval coverage of epidemic peak timing across multiple influenza seasons.
- Enhanced out-of-sample forecast stability and reliability of hospitalization burden estimates by modeling temporal dependencies and lag structures.

Household Welfare and Cash Assistance Phase-Out in Jordan **Emory University, Atlanta, GA**
Research Assistant, Emory Dept. of Economics (Advisor: Dr. Stephen O'Connell) *01/2025 – 08/2025*

- Processed UNHCR Jordan refugee survey microdata, harmonizing 25+ datasets with 100+ household and expenditure indicators and constructing 10+ deprivation measures (housing quality, sanitation, education gaps) for multidimensional poverty and vulnerability.
- Designed econometric frameworks to evaluate the welfare impact of phasing out cash assistance, linking household expenditure patterns to policy-relevant indicators of deprivation and well-being.

Computational Optimization of Molecular Energy Landscapes (DD-CID Methods) **Atlanta, GA**
Research Assistant, Emory Dept. of Mathematics *08/2023 – 05/2024*

- Developed MATLAB solvers for Double Descent with Intermittent Colored Diffusion (DD-CID) to locate global minima in Morse and Lennard-Jones clusters, achieving higher success rates than Newton methods.
- Benchmarked gradient-based, Newton-type, and Hessian-guided strategies, demonstrating ∼30% reduction in local minima trapping and improved convergence stability with eigendirection-aware DD-CID diffusion.

Teaching and Mentorship

- **Teaching Assistant, Intro to Research Design:** Led exam reviews and held weekly office hours.
- **Student Ambassador, Dept. of Data and Decision Sciences:** Advised undergraduates on research opportunities, led peer mentoring sessions, and co-organized departmental workshops and community events.
- **Economics Department Tutor:** Tutored Econometrics, Intermediate Microeconomics, and Macroeconomics.

Honors, Awards, and Presentations

Conference Presentations

- **2025 American Society of Clinical Oncology (ASCO) Quality Care Symposium**, Chicago, IL – Poster: *"Smoking Status and Productivity Loss among Working Age Cancer Survivors in the United States"*
- **Emory Annual Research Symposium**, Atlanta, GA
  - 2025 – Poster: *"The Association Between Private Interviews and Sensitive Questions"*
  - 2024 – Poster: *"The Relationship Between Mental Health and Household Wealth Varies by Wealth Type in Nepal"*

Awards

- **Emory Pathway Funding Award** – $4,000.
- **Summer Undergraduate Research Experience (SURE) Grant** – $4,000.
- **Conference Travel Grant** – $1,000.
- **Dean's List**, Emory College of Arts and Sciences – Fall 2022, Spring/Fall 2023, Spring/Fall 2024, Spring 2025.

Computational & Statistical Skills

Statistical & Programming Languages: R (Tidyverse, survey, brms, lme4, RMST2), Python (Pandas, NumPy, SciPy, Scikit-Learn), Stata, SAS, MATLAB, SQL, Java.

Machine Learning & Data Science: Deep learning frameworks (PyTorch, HuggingFace), causal inference (MatchIt, IPW, Bayesian modeling), survey data analysis (complex survey design in R/Stata).

Cloud & Computational Platforms: GitHub, Google Cloud Platform (GCP), Microsoft Azure, AWS, OpenAI API.

Collaboration & Documentation: LaTeX, Overleaf, Git version control.