MICHAEL AMEYAW SOMUAH

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Applied Health Economist · Medicare and Medicaid Programme Research · Causal Inference and Machine Learning

NBER Mentoring Program in Aging and Health Economics Research

Dear Sir/Madam,

I am an applied health economist holding a Master of Science in Applied Economics from The George Washington University, currently preparing to pursue doctoral study in economics for Fall 2027 entry. My research applies causal inference and machine learning to evaluate the fiscal efficiency of Medicare and Medicaid programmes, identify high-risk aging and low-income beneficiary populations before costly acute care events occur, and estimate the macroeconomic consequences of public healthcare expenditure. As a first-generation scholar from Ghana with limited access to mentorship networks in health and aging economics, I am applying to this programme because it represents a singular opportunity to receive guidance from NBER-affiliated economists at the frontier of the field I intend to spend my career advancing.

My published research in Cambridge Prisms: Global Mental Health demonstrates that functional impairment independently predicts undetected psychological distress in 22.8 percent of functionally limited older adults across a nationally representative sample of 95,325 individuals, validating a zero-cost screening protocol deployable through Medicare Annual Wellness Visits. Three additional manuscripts are currently under peer review: a longitudinal study of health system disengagement among older adults using the Health and Retirement Study at the Journal of Aging and Health; a county-level machine learning framework linking social vulnerability to emergency department demand at EconomiA; and the first quasi-experimental evaluation of PERM audit effectiveness on Medicaid improper payment rates at the Journal of Economic Studies, estimating a combined return on investment of 8.9 times the annual programme cost. This last paper has also been submitted to the NBER Healthcare Administration and Fraud Conference on October 2, 2026, the day immediately following this mentoring workshop.

My proposed doctoral dissertation extends this work through four studies: regression discontinuity at the age-65 Medicare eligibility threshold to estimate the causal effect of Annual Wellness Visit access on downstream emergency costs; staggered difference-in-differences evaluation of Medicaid expansion on psychiatric emergency visits; a Bartik shift-share estimate of the public healthcare expenditure fiscal multiplier on state GDP; and a drug-level event study of IRA Medicare drug price negotiation targeting the American Economic Review.

The mentorship I would most benefit from includes methodological guidance on regression discontinuity implementation, strategic advice on presenting a multi-paper research portfolio to doctoral admissions committees, and connections to NBER-affiliated economists working on Medicare, Medicaid, and the economics of aging. I am committed to an independent research career advancing the evidence base for federal healthcare programme reform and would be deeply honoured to participate in this programme.

Respectfully submitted,

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RESEARCH INTEREST

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EDUCATION

BAUM Tenpers Institute ***January 2026 – Present***

Pre-Doctoral Certificate Programme in Economics

- *Doctoral-level coursework in real analysis, linear algebra, advanced econometric theory, and measure-theoretic probability*

The George Washington University ***Washington, DC***

Master of Science in Applied Economics *May 2025*

- ***Relevant coursework**: Causal Inference and Research Design, Time Series Analysis, Machine Learning for Economics, Quantitative Risk Management, Applied Econometrics, Health Economics*

University of Ghana ***Legon, Ghana***

Bachelor of Science in Agricultural Economics *November 2021*

PUBLICATIONS

- *A review on mitigating antimicrobial resistance by combating falsified medicines in the global pharmaceutical supply chain.* Journal of Pharmaceutical Innovation & Research. Opara, I., Olatunbosun, A., Adeola, D. A., Aneke, O. B., **Somuah, M. A.,** & Olorunkosebi, T. (2025).
- *Functional Impairment Without Depression Diagnosis as an Indicator of Psychological Distress in Older Adults.* Cambridge Prisms: Global Mental Health. **Somuah, M. A.,** Folorunsho, S., Lawal, O. P., & Ani, N. C. (2025)

MANUSCRIPTS UNDER REVIEW

- **Somuah M.A.** Social Vulnerability and Emergency Department Utilization: Evidence from U.S. County-Level Panel Data and Machine Learning Models. *EconomiA*. Manuscript ID: ECON-05-2026-0081
- **Somuah M.A.** Do Audits Improve Medicaid Spending Efficiency in the United States? Evidence from Quasi-Experimental Variation and Machine Learning. *Journal of Economic Studies*. Submitted May 2026.
- **Somuah M.A. and Folorunsho S.** Why Do Older Adults Disengage from Routine Medical Care? Longitudinal Evidence from the Health and Retirement Study. *Journal of Aging and Health*. Under review.

WORKING PAPERS AND RESEARCH IN PROGRESS

- **Somuah M.A.** Does the Medicare Annual Wellness Visit Reduce Downstream Healthcare Costs? Evidence from Regression Discontinuity at the Age-65 Eligibility Threshold. . ***Target journal:** Journal of Health Economics.*
- **Somuah M.A.** Did Medicaid Expansion Reduce Psychiatric Emergency Department Visits? Evidence from Staggered Difference-in-Differences Using the Callaway-Sant'anna Estimator. *In preparation. **Target journal**: American Journal of Health Economics.*
- **Somuah M.A.** Does Public Healthcare Spending Crowd Out Private Investment or Stimulate Economic Growth? Evidence from a Bartik Shift-Share Instrument Using US State-Level Medicare and Medicaid Variation. . ***Target journal**: Journal of Public Economics.*
- **Somuah M.A.** Medicare Drug Price Negotiation, Pharmaceutical Inflation, and Innovation: Evidence from a Drug-Level Event

Study Using the IRA Maximum Fair Price Programme. ***Target journal**: American Economic Review.*

CONFERENCE SUBMISSION

NBER Healthcare Administration and Fraud Conference **Cambridge, MA**
National Bureau of Economic Research, Center for Aging and Health Research *October 2, 2026*

- **Paper submitted**: Do Audits Improve Medicaid Spending Efficiency in the United States? Evidence from Quasi-Experimental Variation and Machine Learning. Under review for presentation.

FELLOWSHIPS, CERTIFICATIONS AND HONORS

GRE Examination **March 2026**

- Quantitative Reasoning: 170 out of 170 91st percentile
- Verbal Reasoning: 165 out of 170 95th percentile

Google Data Analytics Professional Certificate April 2026

- Issued by Google via Coursera. Verification: coursera.org/verify/professional-cert/S8DPBSHJKLVM

GAIN Mentorship Programme **2022 – 2023**

- Competitive international mentorship programme covering graduate school application fees and providing research guidance for international students applying to US graduate programmes
- Conducted comparative analysis to evaluate behavioral differences between members and casual riders, identifying usage patterns, peak times, and retention opportunities.
- Developed visualizations in ggplot2 to communicate findings, and delivered data-driven recommendations for stakeholders to improve service efficiency and marketing strategies

PROFESSIONAL EXPERIENCE

World Bank Data Lab • *Washington, DC*
Research Analyst – Final Research Project (Capstone Presentation) 01/2025 - 05/2025

- Conducted policy-relevant econometric research using World Bank Enterprise Survey data across four Sub-Saharan African countries, examining the causal impact of infrastructure reliability on firm productivity.
- Implemented **Two-Stage Least Squares (2SLS)** estimation with instrumental variables, performing IV diagnostics, robustness checks, and heteroskedasticity-robust inference to ensure credible causal identification.
- Cleaned, validated, and analyzed **firm-level microdata (900+ observations)** using **R and Stata**, maintaining reproducible workflows and high data accuracy standards.
- Produced evidence-based policy insights demonstrating that a **1% increase in power outages reduces firm productivity by approximately 6%**, with implications for public investment, energy policy, and SME resilience.
- Presented findings to World Bank researchers and policy stakeholders, translating quantitative results into actionable recommendations on grid reliability, renewable energy adoption, and economic resilience.

Department of Economics, The George Washington University • *Washington, DC*
Graduate Research Assistant 08/2023 - 12/2024

- Supported faculty-led empirical research projects involving **macroeconomic forecasting**, time-series modeling, and cross-country economic analysis.
- Applied **R and Stata** to analyze GDP growth, inflation, and macroeconomic volatility across **G7 economies**, emphasizing model efficiency, robustness, and forecast accuracy.
- Conducted data cleaning, transformation, and validation of macroeconomic time-series datasets, ensuring consistency across multiple data sources.
- Assisted in communicating empirical findings through tables, figures, and technical summaries for academic and policy-oriented audiences.

TECHNICAL SKILLS AND METHODS

Statistical and Econometric Software: Stata (primary), R (RStudio), Python (pandas, numpy, scikit-learn, statsmodels), SQL

Causal Inference Methods: Difference-in-differences including staggered DiD with Callaway-Sant'anna estimator; regression discontinuity design (sharp and fuzzy); instrumental variables and Two-Stage Least Squares; Bartik shift-share instruments; event study design; panel fixed effects; wild cluster bootstrap inference

Machine Learning Methods: XGBoost, Random Forest, Isolation Forest anomaly detection, logistic regression, LASSO, cross-validation and holdout evaluation, SHAP feature importance

Time Series Methods: ARIMA, VAR, ARDL, Error Correction Models, impulse response functions, forecast error variance decomposition

Federal Healthcare Data: Behavioral Risk Factor Surveillance System (BRFSS), Health and Retirement Study (HRS), Medicare Current Beneficiary Survey (MCBS), CDC Social Vulnerability Index, NCHS Emergency Department data, CMS PERM Supplemental Data Reports, CMS State Drug Utilization Data, CMS Maximum Fair Price files, BEA State GDP data

Visualisation and Reporting: ggplot2, Tableau, Power BI, Excel (advanced), R Markdown

PROFESSIONAL AFFILIATION

American Society of Health Economists (ASHEcon)	Member
American Economic Association (AEA)	Member