

Nana Kena Frempong, Ph.D.

1355 Peabody ST. NW, APT 203, Washington DC, 20011, USA

Phone: +1 (757) 550-8340 | Email: nkf.cos@gmail.com, Nanaken.Frempong@howard.edu

Profile

A dedicated and accomplished statistics faculty member with over a decade of experience in higher education, specializing in statistical inference, applied statistics, biostatistics, and actuarial science. A passionate educator and researcher with a strong background in disease modeling, probability models, longitudinal data analysis, and survival analysis. Skilled in developing predictive models for data-driven decision-making, and proficient in statistical computing tools for health research and insurance applications. Committed to continual innovation in research, high-quality teaching at all levels, and service to the academic and professional community.

Education

- **Ph.D. in Mathematical Statistics**, Kwame Nkrumah University of Science and Technology (KNUST), Ghana, 2015-2017.
- **M.Sc. in Biostatistics**, Hasselt University, Belgium, 2007.
- **M.Sc. in Applied Statistics**, Hasselt University, Belgium, 2006.
- **B.Sc. in Mathematics**, KNUST, Ghana, 2002.

Academic Appointments

- **Temporary Full-time Faculty, Howard University (USA)** — August 2026 – *present*
- **Professor of Statistics**, KNUST (Ghana) — August 2025
- **Associate Professor of Statistics**, KNUST (Ghana) — *August 2021 – July 2025*
- **Independent Tutor, Varsity Tutor (USA)** – *September 2018- July 2026*
- **Senior Lecturer**, KNUST (Ghana) — *August 2014 – July 2021*
- **Lecturer**, KNUST (Ghana) — *March 2009 – July 2014*
- **Demonstrator (Teaching Assistant)**, KNUST (Ghana) — *August 2004 – July 2005*
- **National Service Teaching Asst.**, KNUST (Ghana) — *Sept 2002 – July 2003*

Research Interests

- **Statistical Methodology**: Development of new statistical methods or improvement of existing ones for greater efficiency and robustness.
- **Biostatistics & Epidemiology**: Statistical analysis in epidemiology and healthcare data (disease modeling, longitudinal studies, survival analysis) to inform medical decision-making and public health policy.
- **Actuarial Science & Financial Statistics**: Mortality modeling, longevity risk assessment, insurance risk analytics (e.g. life and health insurance predictive modeling, premium pricing, claims management), and volatility modeling in financial time series (stock market analysis).
- **Educational Statistics**: Application of statistical methods to educational research and policy evaluation for sustainable educational development.

- **Machine Learning & Predictive Modeling:** Integration of statistical techniques with machine learning algorithms for predictive analytics and data-driven decision support across various domains.

Selected Publications

- Silas Alebikenaba Ayariga, James Azuure Atambire, **Nana Kena Frempong** et al. Bayesian Gaussian Process Modeling of Nonstationary Climate Extremes with Unknown Physical Drivers: A GP-GEV Framework for West African Rainfall, 31 July 2026, PREPRINT (Version 1) available at Research Square [<https://doi.org/10.21203/rs.3.rs-10529823/v1>]
- K. Tawiah, **N. K. Frempong**, A. O. Adebajji, and R. K. Ansah, “ *Modeling of Years of Cohabitation, Children Ever Born, and Number of Living Children of Women of Reproductive Age Using Trivariate Poisson Regression,*” *Health Science Reports* 9 (2026): e72982, <https://doi.org/10.1002/hsr2.72982>.
- Antwi, J. B., & **Frempong, N. K.** (2026). Beyond airborne spread: a dual-route Wells-Riley extension for estimating norovirus infection risk in Ghanaian pediatric wards. *Mathematics in Medical and Life Sciences*, 3(1). <https://doi.org/10.1080/29937574.2026.2714847>
- Tawiah, K., **Frempong, N. K.**, Adebajji, A. O., Asosega, K. A., & Kwame Ansah, R. (2026). A Newton-Raphson approach to trivariate Poisson regression modeling: a simulation study. *Journal of Simulation*, 1–18. <https://doi.org/10.1080/17477778.2026.2652453>
- A.Cham, **Frempong, N. K.**, R.Opoku, F.Davis, and S. K.Appiah, (2026). *The Impact of Renewable and Non-Renewable Energy on Economic Growth: Evidence From Sub-Saharan African Countries Using Multivariate Panel Vector Autoregressive Modeling.* *Energy Science & Engineering*: e70480, <https://doi.org/10.1002/ese3.70480>.
- Nyantah, R., **Frempong, N.K.**, and Larbi, E. (2025). *Enhancing Geometry Learning: The Impact of Jigsaw Cooperative Strategy on Ghanaian Senior High School Students’ Understanding of Circle Theorems.* *East African Journal of Education Studies*, 8(2), 661–677. DOI: 10.37284/eajes.8.2.3124
- Okutu, J.K., **Frempong, N.K.**, Appiah, S.K., and Adebajji, A.O. (2024). *Generalization of Odd Ramos-Louzada generated family of distributions: Properties, characterizations, and applications to diabetes and cancer survival datasets.* *Heliyon*, 10(10), e030690. DOI: 10.1016/j.heliyon.2024.e030690
- **Frempong, N.K.** and Avuglah, R.K. (2024). *Simulation Study of Estimators of the Gamma Rate Parameter Using MLE as a Baseline Estimator.* *Journal of the Indian Society for Probability and Statistics*, 25(1), 307–325. DOI: 10.1007/s41096-024-00182-z
- **Frempong, N.K.**, Avuglah, R.K., Anane, J.A., and Atambire, J.A. (2023). *Determinants of Length of Stay of Snakebite Victims in a Hospital: A Statistical Modeling Approach.* *European Journal of Theoretical and Applied Sciences*, 1(5), 1445–1453. DOI: 10.59324/ejtas.2023.1(5).124
- Okutu, J.K., **Frempong, N.K.**, Appiah, S.K., and Adebajji, A.O. (2023). *A New Generated Family of Distributions: Statistical Properties and Applications with Real-Life Data.* *Computational and Mathematical Methods*, vol. 2023, Article ID 9325679 (18 pages). DOI: 10.1155/2023/9325679
- Buabeng, A., Simons, A., **Frempong, N.K.**, and Ziggah, Y.Y. (2023). *Hybrid intelligent predictive maintenance model for multiclass fault classification.* *Soft Computing*. DOI: 10.1007/s00500-023-08993-1
- Agyarko, K., **Frempong, N.K.**, and Wiah, E.N. (2023). *Hybrid Model for Stock Market Volatility.* *Journal of Probability and Statistics*, vol. 2023, Article ID 6124649 (10 pages). DOI: 10.1155/2023/6124649

- **Frempong, N.K.**, Acheampong, T., Apenteng, O.O., Nakua, E., and Amuasi, J.H. (2021). *Does the data tell the true story? A modeling assessment of early COVID-19 pandemic suppression and mitigation strategies in Ghana*. *PLoS ONE*, 16(10): e0258164. DOI: 10.1371/journal.pone.0258164
- **Frempong, N.K.**, Nicholas, N. and Boateng, M.A. (2017). *Decision tree as a predictive modeling tool for auto insurance claims*. *International Journal of Statistics and Applications*, 7(2), pp. 117-120. DOI: 10.5923/j.statistics.20170702.07

(Over 70 peer-reviewed publications in total; full list available on request. With strong footprint in Distribution theory and survival models, Financial time series volatility modeling, Predictive maintenance frameworks, Disease modeling and Machine Learning)

Teaching Experience

- **Undergraduate courses:** Taught core and elective undergraduate courses in statistics and actuarial science, including *Time series analysis and forecasting*, *Applied Time Series*, *Statistical methods*, *Statistical Inference*, *Analysis of Survival Data*, *Survival Analysis*, *Introduction to Probability and Statistics*, *Statistical Inference*, *Introduction to Bayesian Analysis*, *Stochastic Process* and related subjects. Emphasized conceptual understanding and practical data analysis skills through project-based learning.
- **Graduate courses:** Developed and taught graduate-level courses such as *Survival and Stochastic Models*, *Advanced Survival Models*, *Longitudinal Data Analysis & Disease Modeling*, *Predictive Analytics*, *Probability Theory*, *Data Mining and Visualization*, and *Statistical Methods for Biomedical Data*, *Risk Theory*, *Medical Statistics*, *Applied Statistics*, *Engineering Data Analysis*. Supervised graduate student projects and facilitated seminars on advanced statistical modeling techniques.

Student Supervision & Mentorship

- **Doctoral Supervision:** Supervised 8 Ph.D. students to completion (2019–2025) in areas of mathematical statistics, applied statistics, Education and actuarial science; currently advising 3 additional doctoral candidates. Responsibilities included guiding research design, methodology, and professional development of each student.
- **Masters Supervision:** Supervised 14 M.Phil. / M.Sc. theses (since 2019) covering topics in biostatistics, financial statistics, and applied data analysis.
- **External Examiner:** Served as external examiner for Ph.D. dissertations at other international universities, providing independent assessment and feedback on doctoral research in statistics and applied mathematics.
- **Mentorship:** Mentored junior faculty and graduate students (formally assigned as faculty mentor in 2021), offering guidance on research projects, teaching practice, and career development. Extensive experience supervising and mentoring graduate students. Served as primary advisor for numerous Ph.D. and Master's students, guiding their research from inception to completion. This includes mentoring students in diverse areas such as epidemiological modeling, statistical methodology, financial risk modeling, and educational statistics. Many advisees have successfully completed their degrees and proceeded to academic or industry positions, reflecting a strong commitment to developing the next generation of statisticians.

Professional (Industry) Experience

- **Lead Consultant (Financial Stability) – Bank of Ghana, Accra (2021–2022):** Advised the Financial Stability Department on statistical risk modeling and data analysis using modern statistical tools. Developed models to monitor banking sector stability, stress testing, and risk indicator dashboards for the central bank.
- **Senior Data Analyst – ALERRT Project at KCCR, Kumasi (2020–2021):** Led data management and analysis for the **ALERRT** (African Coalition for Epidemic Research, Response and Training) project at the Kumasi Centre for Collaborative Research. Conducted statistical analyses of epidemiological data to support outbreak preparedness and response research.
- **Curriculum Consultant – DSCHANGE Program, Ghana (2021–2022):** Consulted on the *Data Science for Child Health in Ghana (DSCHANGE)* initiative. Assisted in developing a data science curriculum and training program focused on child health outcomes, ensuring integration of statistical methodologies and practical analytics skills.
- **Statistical Analyst – Snakebite Epidemiology and Outcomes Project, KCCR (2020–2021):** Analyzed epidemiological and clinical data for a research project on snakebite incidents in Ghana. Applied survival analysis and geospatial statistical methods to identify factors influencing patient outcomes and inform public health interventions.

Service and Leadership

- **Department & University Leadership (KNUST):** Held key administrative and leadership roles including Acting Head of Department (2022, 2023), Postgraduate Programs Coordinator for Statistics & Actuarial Science (2021–2024), Distance Learning (IDL) Coordinator (2019–2021), and Examinations Officer for the Department of Mathematics (2016–2019). Led curriculum updates, managed program delivery, and coordinated academic quality assurance efforts in these roles.
- **Committee Service (KNUST):** Served on numerous departmental and university committees. Chaired the committee to develop the Statistics curriculum and compile departmental reports (2021). Member of the KNUST Quality Assurance *Tracer Study* committee (2022) evaluating alumni outcomes. Served on Ph.D. supervisory and examination committees, contributing to graduate program oversight and quality.
- **National Service:** External Assessor/Examiner at several universities, Program Evaluator for Ghana Tertiary Education Commission.
- **Professional Service:** Active in the broader academic community as a peer reviewer and external assessor. Reviewer for several international journals (e.g., *Financial Innovation*; *Journal of Financial Management in Property & Construction*; *Scientific African*, *Heliyon*, *PLoS ONE*, *Frontiers in Artificial Intelligence*, *section AI in Finance*, *Wiley Series*, etc) and for grant/funding proposals (reviewer for KNUST Research Fund – 2022). Served as external assessor for academic promotions at other public universities in Ghana. Additionally, acted as external moderator for examinations at sister institutions and as external examiner for graduate theses, ensuring academic standards across institutions. Serves as External examiner for International Universities.
- **Outreach & Community Engagement:** Engaged in mentorship and outreach to promote statistics and education. Guest speaker at student professional events, such as the Actuarial Science Students Association (2022), delivering talks on career development in statistics. Participated as a resource person in workshops (e.g. Women in STEM faculty workshop, 2022) to support capacity building and encourage underrepresented groups in statistical sciences.

Professional Associations

- **Fellow**, Royal Statistical Society (UK) – *Elected 2012*; active member (2012–Present)
- **Member**, International Biometric Society (IBS) – *2013–Present*
- **Member**, American Statistical Association (ASA) – *2021–Present*
- **Member**, National Institute for Mathematical Sciences (NIMS, Ghana) – *2013–Present*
- **Member**, Ghana Statistical Association – *2023–Present*
- **Member**, Ghana Science Association – *2014–Present*

Grants and Funded Projects

- **Co-Principal Investigator** – *CoNeMEsSA: Competence Network Mathematical Epidemiology in sub-Saharan Africa*
Funded by the German Academic Exchange Service (DAAD) through the Federal Ministry for Economic Cooperation and Development (BMZ) [01/01/2024 – 31/12/2027]
Role: Co-PI leading research and training in mathematical epidemiology, including supervision of Master's and PhD students across sub-Saharan Africa.
- Coordinator of Statistics for **DSCHANGE** program, funded by National Institutes of Health (NIH) in collaboration with the University of Washington to train masters' and PhD students in Data Science for Child Health in Ghana, KNUST. [2021-2025]

Skills

- **Statistical Analysis & Domain Expertise:** Biostatistics, epidemiological modeling, survival and longitudinal data analysis; actuarial modeling (mortality tables, risk projections); financial statistics and time series forecasting; educational data analysis.
- **Statistical Software & Programming:** Proficient in R, SAS, STATA, SPSS, EViews, and Tableau for data analysis and visualization. Programming experience in Python (scientific libraries, Jupyter) and SQL (database querying) for statistical computing and reproducible research.
- **Leadership & Project Management:** Demonstrated team leadership and project management skills. Experience coordinating academic programs and research projects, mentoring teams, and successfully managing multiple tasks. Strong organizational and strategic planning abilities with a focus on achieving institutional goals and research objectives.

References

Professor Joseph Abeiku Ackora-Prah
Email: jaackora-prah.cos@knust.edu.gh
Phone: +233208180547

Professor Akoto Yaw Omari-Sasu
Email: ayomari-sasu@knust.edu.gh
Phone: +233246289226