Prof. Nana Kena Frempong

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PROFILE

Nana Kena Frempong is an Associate Professor at the Kwame Nkrumah University of Science and Technology in the Department of Statistics and Actuarial science. He earned his BSc. Mathematics in his mother university and obtained two MSc. degrees in Applied Statistics and Biostatistics at the University of Hasselt, Belgium. He holds a PhD in Mathematical Statistics.

Nana Kena Frempong research interest are in theory of estimation, statistical modeling in specific areas like multivariate data analysis, Longitudinal data analysis, Time series analysis and data visualization. Other research interest includes disease modeling and epidemiology. He also collaborates with other scientists from engineering, biochemistry, building and construction, Economist, Epidemiologist and many more. His passion is to make students understand statistics as a subject matter. He has a number of publications in a reffered journals.

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RESEARCH

Interests	Applied statistical modeling · Biostatistics and Machine Learning
Areas	Statistics and Probability · Finance · Management Science and Operations Research · Global and Planetary Change · Economics and Econometrics · Artificial Intelligence

RESEARCH SUMMARY

56	382	11	14	0.67	2%
Publications	Citations	h-index	i10-index	Field-weighted impact	World top 10%

Counted from the 56 publications listed below, 2010–2026. Field-weighted impact is the mean over the 42 works scored for it; 1.00 is the world average for works of the same field, type and year. 1 of the 42 papers scored for it are among the world's most cited tenth for their field, type and year.

POSITIONS

Associate Professor 2021–present
Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Senior Lecturer 2014–2021
Department of Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Lecturer 2009–2014
Department of Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

EDUCATION AND QUALIFICATIONS

PhD Mathematical Statistics 2015–2017
Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

MSc. Biostatistics 2005–2007
Universiteit Hasselt, Hasselt, Belgium

BSc. Mathematics 1998–2002
Mathematics, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

PUBLICATIONS

Journal articles 56

1. Kassim Tawiah, **Nana Kena Frempong**, Atinuke Olusola Adebanji, Killian Asampana Asosega, Richard Kwame Ansah (2026). A Newton-Raphson approach to trivariate Poisson regression modeling: a simulation study. *Journal of Simulation*. https://doi.org/10.1080/17477778.2026.2652453
2. Jennifer Belt Antwi, **Nana Kena Frempong** (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*. https://doi.org/10.1080/29937574.2026.2714847
3. Welson Bentum, Emmanuel Odame Owiredu, **Nana Kena Frempong**, Michael Asante Ofosu, Esther Boateng, Kwaku Obeng Owusu, Agyeman Shadrack, Elvis Anyimadu Asiedu, Sandra Addai-Henne, Wilhemina Adoma Pels, Harriet Achiaa Dwamena (2026). Beyond farm size: spatial determinants of cocoa productivity in Ashanti Region, Ghana. *Frontiers in Agronomy*. https://doi.org/10.3389/fagro.2026.1901636
4. Rahmat Opoku Nyantah, Karim Azumah, **Nana Kena Frempong**, Ababio Nkansah (2026). Effects of Animation-Supported Jigsaw Cooperative Learning on Students' Achievement in Geometry: Evidence from a Linear Mixed-Effects Model. *International Journal of Research in Education and Science*. https://doi.org/10.46328/ijres.6015
5. Harriet Achiaa Dwamena, **N. K. Frempong**, A. O. Adebanji (2026). Evaluation of Variance Normalized ANOVA-Simultaneous Component Analysis (VN-ASCA) through Controlled Simulations. *Mathematics and Statistics*. https://doi.org/10.13189/ms.2026.140110
6. Kassim Tawiah, **Nana Kena Frempong**, Atinuke Olusola Adebanji, Richard Kwame Ansah (2026). 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*. https://doi.org/10.1002/hsr2.72982
7. Amadou Cham, **Nana Kena Frempong**, Richard Opoku, Francis Davis, Simon Kojo 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*. https://doi.org/10.1002/ese3.70480
8. Rahmat Opoku Nyantah, **Nana Kena Frempong**, Ernest Larbi (2025). Enhancing Student Achievement in Circle Theorems: Integrating Computer Animation with the Jigsaw Cooperative Learning Model. *International Journal of Mathematics and Mathematics Education*. https://doi.org/10.56855/ijmme.v3i2.1299
9. Adu Sakyi, P Amoako-Yirenkyi, **NK Frempong**, AY Omari-Sasu (2025). Seemingly unrelated time series model for forecasting the peak and short-term electricity demand: Evidence from the Kalman filtered Monte Carlo method (vol 9, e18821, 2023). *HELIYON*. https://scholar.google.com/scholar?cluster=12714748659627117810&hl=en&oi=scholarr
10. John Kwadey Okutu, **Nana K. Frempong**, Simon K. Appiah, Atinuke O. Adebanji (2024). Generalization of Odd Ramos-Louzada generated family of distributions: Properties, characterizations, and applications to diabetes and cancer survival datasets. *Heliyon*. https://doi.org/10.1016/j.heliyon.2024.e30690

11. John Kwadey Okutu, **Nana K. Frempong**, Atinuke O. Adebanji, Simon K. Appiah (2024). Modified Ramos-Louzada-G family with baseline Weibull distribution: Properties, characterizations, regression, and applications. *Scientific African*. https://doi.org/10.1016/j.sciaf.2024.e02352

12. **Nana Kena Frempong**, Richard Kodzo Avuglah (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*. https://doi.org/10.1007/s41096-024-00182-z

13. John Kwadey Okutu, **Nana K. Frempong**, Simon K. Appiah, Atinuke O. Adebanji (2023). A New Generated Family of Distributions: Statistical Properties and Applications with Real-Life Data. *Computational and Mathematical Methods*. https://doi.org/10.1155/2023/9325679

14. **Nana Kena Frempong**, Richard Kodzo Avuglah, Jacob Adubasum Anane, James Atambire (2023). Determinants of Length of Stay of Snakebite Victims in a Hospital. Statistical Modeling Approach. *European Journal of Theoretical and Applied Sciences*. https://doi.org/10.59324/ejtas.2023.1(5).124

15. Kofi Agyarko, **Nana Kena Frempong**, Eric Neebo Wiah (2023). Hybrid Model for Stock Market Volatility. *Journal of Probability and Statistics*. https://doi.org/10.1155/2023/6124649

16. Albert Buabeng, Anthony Simons, **Nana Kena Frempong**, Yao Yevenyo Ziggah (2023). Hybrid intelligent predictive maintenance model for multiclass fault classification. *Soft Computing*. https://doi.org/10.1007/s00500-023-08993-1

17. Kofi Agyarko, Eric Neebo Wiah, **Nana Kena Frempong** (2023). Modelling the volatility of the Ghana stock market: A comparative study. *International Journal of Statistics and Applied Mathematics*. https://doi.org/10.22271/maths.2023.v8.i3b.998

18. Frank Kofi Owusu, Peter Amoako-Yirenkyi, **Nana Kena Frempong**, Akoto Yaw Omari-Sasu, Isaac Adjei Mensah, Henry Martin, Adu Sakyi (2023). Seemingly unrelated time series model for forecasting the peak and short-term electricity demand: Evidence from the Kalman filtered Monte Carlo method. *Heliyon*. https://doi.org/10.1016/j.heliyon.2023.e18821

19. Eric Teye Mensah, Alexander Boateng, **Nana Kena Frempong**, Daniel Maposa (2023). Simulating stock prices using geometric Brownian motion model under normal and convoluted distributional assumptions. *Scientific African*. https://doi.org/10.1016/j.sciaf.2023.e01556

20. John Kwadey Okutu, **Nana K. Frempong**, Simon K. Appiah, Atinuke O. Adebanji (2023). The Odd Ramos-Louzada Generator of distributions with applications to failure and waiting times. *Scientific African*. https://doi.org/10.1016/j.sciaf.2023.e01912

21. M. A. Boateng, A. Y. Omari-Sasu, R. K. Avuglah, **N. K. Frempong** (2022). A Mixture of Clayton, Gumbel, and Frank Copulas: A Complete Dependence Model. *Journal of Probability and Statistics*. https://doi.org/10.1155/2022/1422394

22. **NK Frempong** (2022). An intelligent predictive maintenance framework with autonomous feature selection based on hybrid fuzzy set and rough set theories for multiclass fault classification. *Ghana Journal of Technology*. https://scholar.google.com/scholar?cluster=2561470780831765772&hl=en&oi=scholarr

23. Albert Buabeng, Anthony Simons, **Nana Kena Frempong**, Yao Yevenyo Ziggah (2022). Predictive Maintenance Model Based on Multisensor Data Fusion of Hybrid Fuzzy Rough Set Theory Feature Selection and Stacked Ensemble for Fault Classification. *Mathematical Problems in Engineering*. https://doi.org/10.1155/2022/4372567

24. **NK Frempong** (2021). A Simulation Study to Examine the Bias of Some Sample Measures of Skewness. *Applied Mathematical Sciences*. https://www.academia.edu/download/106406467/frempongAMS1-4-2021.pdf

25. Albert Buabeng, Anthony Simons, **Nana Kena Frempong**, Yao Yevenyo Ziggah (2021). A novel hybrid predictive maintenance model based on clustering, smote and multi-layer perceptron neural network optimised with grey wolf algorithm. *SN Applied Sciences*. https://doi.org/10.1007/s42452-021-04598-1

26. **Nana Kena Frempong**, Theophilus Acheampong, Ofosuhene O. Apenteng, Emmanuel Nakua, John H. Amuasi (2021). Does the data tell the true story? A modelling assessment of early COVID-19 pandemic suppression and mitigation strategies in Ghana. *PLoS ONE*. https://doi.org/10.1371/journal.pone.

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27. **Nana Kena Frempong**, Richard Kodzo Avuglah, Isaac Kwame Dontwi, Francis Kwame Bukari (2021). Improved estimators for the rate parameter of gamma model using asymptotic properties. *Heliyon*. https://doi.org/10.1016/j.heliyon.2021.e06941
28. Henry Martin, Peter Amoako-Yirenkyi, Aarne Pohjonen, **Nana K. Frempong**, Jukka Komi, Mahesh Somani (2020). Statistical Modeling for Prediction of CCT Diagrams of Steels Involving Interaction of Alloying Elements. *Metallurgical and Materials Transactions B*. https://doi.org/10.1007/s11663-020-01991-w
29. Peter Nyarko, Isaac Dontwi, **Nana Frempong** (2018). A Mathematical Model for Mycolactone Toxin Reaction and Di usion in Cell Cytoplasm. *Journal of Advances in Mathematics and Computer Science*. https://doi.org/10.9734/jamcs/2018/41382
30. **NK Frempong** (2018). A mathematical model for mycolactone toxin reaction and diffusion in cell cytoplasm. *J. Adv. Math. Comput. Sci*. https://www.researchgate.net/profile/Nana-Kena-Frempong/publication/325947449_A_Mathematical_Model_for_Mycolactone_Toxin_Reaction_and_Di_usion_in_Cell_Cytoplasm/links/5b359cf5aca2720785f48dca/A-Mathematical-Model-for-Mycolactone-Toxin-Reaction-and-Di-usion-in-Cell-Cytoplasm.pdf
31. Maxwell Akwasi Boateng, Akoto Yaw Omari-Sasu, Richard Kodzo Avuglah, **Nana Kena Frempong** (2018). Hybrid Clayton-Frank Convolution-Based Bivariate Archimedean Copula. *Journal of Probability and Statistics*. https://doi.org/10.1155/2018/5902839
32. **NK Frempong**, DA Owusu (2018). Investigating Heterogeneity in Mortality of Male Pensioners. J Biostat Biometric App 3 (2): 203 Abstract In this paper, the objective was to study differential factors that .... *Keywords: Pensioners*. https://www.researchgate.net/profile/Nana-Kena-Frempong/publication/326301292_Investigating_Heterogeneity_in_Mortality_of_Male_Pensioners/links/5b44d38ca6fdcc66191512d4/Investigating-Heterogeneity-in-Mortality-of-Male-Pensioners.pdf
33. **NK Frempong** (2018). Modelling the force of infection for Hepatitis B among heterogeneous groups at the Komfo-Anokye Teaching Hospital. *J Biostat Biometric App*. https://scholar.google.com/scholar?cluster=14733185494268830694&hl=en&oi=scholarr
34. Maxwell Akwasi Boateng, Akoto Yaw Omari-Sasu, **Nana Kena Frempong**, Richard Kodzo Avuglah (2018). On a Hybrid Clayton-Gumbel and Gumbel-Frank Bivariate Copulas with Application to Stock Indices. *Journal of Advances in Mathematics and Computer Science*. https://doi.org/10.9734/jamcs/2019/45668
35. **NK Frempong**, MA Boateng (2017). Decision tree as a predictive modeling tool for auto insurance claims. *International Journal of Statistics and Applications*. https://www.academia.edu/download/106321646/showpaperpdf.pdf
36. **Nana Kena Frempong** (2017). Fitting Finite Mixtures of Generalized Linear Regressions on Motor Insurance Claims. *International Journal of Statistical Distributions and Applications*. https://doi.org/10.11648/j.ijsd.20170304.19
37. MA Boateng, AY Omari-Sasu, RK Avuglah, **NK Frempong** (2017). On two random variables and archimedean copulas. *International Journal of Statistics and Applications*. https://www.academia.edu/download/132417150/ontworandomvariables.pdf
38. Richard Ohene Asiedu, **Nana Kena Frempong**, Hans Wilhelm Alfen (2017). Predicting likelihood of cost overrun in educational projects. *Engineering Construction & Architectural Management*. https://doi.org/10.1108/ecam-06-2015-0103
39. Ekow Ewusi Amissah, **Nana Kena Frempong**, Emmanuel DeGraft Johnson Owusu-Ansah (2016). Accessing Individual Students Academic Performance Using Random Effect Analysis (Multilevel Analysis). *Communications in Mathematics and Statistics*. https://doi.org/10.1007/s40304-016-0089-y
40. Eric Okyere, Francis Oduro, Samuel Amponsah, Isaac Dontwi, **Nana Frempong** (2016). Fractional Order SIR Model with Constant Population. *British Journal of Mathematics & Computer Science*. https://doi.org/10.9734/bjmcs/2016/23017
41. **NK Frempong**, E Nakua (2016). Modeling Road Accident Fatalities in a Subregion Of Ghana. *American*

Journal of Scientific and Industrial Research. https://scihub.org/media/ajsir/pdf/2016/08/AJSIR-7-4-88-94.pdf

42. Richard Ohene Asiedu, **Nana Kena Frempong**, Gabriel Nani (2016). Parametric time overrun estimation of building projects. *Journal of Financial Management of Property and Construction*. https://doi.org/10.1108/jfmpc-10-2015-0037

43. Yao Elikem Ayekple, Derrick Asamoah Owusu, **Nana Kena Frempong**, Prince Kwaku Fefemwole (2016). The Fundamental Matrix of the Simple Random Walk with Mixed Barriers. *Journal of Mathematics Research*. https://doi.org/10.5539/jmr.v8n6p128

44. **NK Frempong** (2015). An SITR Analysis of Treatment Model of Hepatitis B Epidemic. *Mathematical theory and modeling*. https://www.academia.edu/download/106406476/27737-30454-1-PB.pdf

45. Kotei Richard, **NK Frempong** (2015). Development of Groundwater Recharge Model for the Sumanpa Catchment at Ashanti-Mampong-Ashanti Area in Ghana. *Science Research*. https://doi.org/10.11648/j.sr.20150306.14

46. **Nana Kena Frempong** (2015). Emerging Relationships Between Macroeconomic Indicators and Real Economic Activities in Ghanaian Economy. *Economics*. https://doi.org/10.11648/j.eco.20150406.14

47. Akoto Yaw Omari-Sasu, **Nana Kena Frempong**, Maxwell Akwasi Boateng, Richard Kena Boadi (2015). Modeling Stock Market Volatility Using GARCH Approach on the Ghana Stock Exchange. *International Journal of Business and Management*. https://doi.org/10.5539/ijbm.v10n11p169

48. Yao Elikem Ayekple, Emmanuel Harris, **Nana Kena Frempong**, Joshua Amevialor (2015). Time Series Analysis of the Exchange Rate of the Ghanaian Cedi to the American Dollar. *Journal of Mathematics Research*. https://doi.org/10.5539/jmr.v7n3p46

49. **Nana Kena Frempong** (2015). Volatility Assessment of Equities on the Ghana Stock Exchange. *International journal of statistics and applications*. https://www.academia.edu/download/132534268/showpaperpdf.pdf

50. **Frempong, N, K**, Wahab Abdul, I, Okyere, E (2014). An Item Response Model for Understanding Item. *HAL (Le Centre pour la Communication Scientifique Directe)*.

51. **N. Frempong** (2014). An Item Response Model for Understanding Item Non-response in Ghanaian Surveys. *British Journal of Mathematics & Computer Science*. https://doi.org/10.9734/bjmcs/2014/6115

52. **NK Frempong** (2014). Application of generalized estimating equation (GEE) model on students' academic performance. *Appl Math Sci*. https://www.academia.edu/download/106406573/aduAMS65-68-2014-2.pdf

53. P. Amoako-Yirenkyi, **N. Frempong**, J. Appati, J. Hafron-Acquah, I. Dontwi (2014). Threshold Analysis of Wavelet Based Fingerprint Feature Extraction Methods on Multiple Impression Dataset. *British Journal of Mathematics & Computer Science*. https://doi.org/10.9734/bjmcs/2015/13000

54. **NK Frempong**, D Asamoah Owusu (2012). Survival analysis on marriage and divorce in the Kumasi Metropolis. *Canadian Journal on Computing in Mathematics, Natural Sciences, Engineering and Medicine*. https://www.researchgate.net/profile/Nana-Kena-Frempong/publication/316648517_SURVIVAL_ANALYSIS_ON_MARRIAGE_AND_DIVORCE_IN_THE_KUMASI_METROPOLIS/links/5909ca35458515ebb49a9c11/SURVIVAL-ANALYSIS-ON-MARRIAGE-AND-DIVORCE-IN-THE-KUMASI-METROPOLIS.pdf

55. **NK Frempong** (2010). Mathematical modeling of Hepatitis C Virus transmission among injecting drug users and the impact of vaccination. *Am J Sci Ind Res*. https://www.researchgate.net/profile/Nana-Kena-Frempong/publication/267193110_Mathematical_modeling_of_Hepatitis_C_Virus_transmission_among_injecting_drug_users_and_the_impact_of_vaccination/links/56f3bdf408ae38d7109b7417/Mathematical-modeling-of-Hepatitis-C-Virus-transmission-among-injecting-drug-users-and-the-impact-of-vaccination.pdf

56. K. NSIAH, V. P. DZOGBEFIA, D. ANSONG, H. BOATENG, D. OCLOO, E. OSEI-FREMPONG, **N. KENA FREMPONG**, A. OSEI AKOTO (2010). The incidence of malaria and the comparison of hematological and biochemical indices of Plasmodium falciparum-parasitemic and aparasitemic sickle cell disease (SCD)

patients. *International Journal of Laboratory Hematology*. https://doi.org/10.1111/j.1751-553x.2010.01231.x