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Address:
 Headington,
 Oxford, UK.

DR. CLEMENT TWUMASI, PhD

PERSONAL INFORMATION

- **Nationality:** Ghanaian
- **Marital status:** Single
- **Language Spoken:** English and Asante Twi



PROFESSIONAL SUMMARY:

I am a dedicated and results-driven statistician with a strong and robust foundation in mathematics and statistics, complemented by advanced computational and programming skills. I am committed to continuous professional development and to delivering high-quality, impactful work across academic and applied research environments. My expertise spans a broad range of statistical and mathematical modelling techniques, including:

- Stochastic and deterministic infectious disease modelling
- Quantitative analysis of obstetric ultrasound and perinatal risk factors
- Agent-based modelling of biological systems (e.g., gyrodactylid-fish system)
- Clinical trials, observational studies & human challenge trials
- Electronic Health Record (EHR)-wide association studies (EHR-WAS)
- Adaptive, Bayesian model-based designs for dose finding and escalation
- Multi-state survival and regression modelling (fixed & mixed effects)
- Dimension-reduction and variable selection methods
- Functional data analysis, mathematical biology, and computational statistics
- Machine learning, proteomics, and genomic data analysis
- Markov models, Bayesian inference, and approximate Bayesian computation
- Econometric & Time series modelling and credit risk analysis
- State-of-the-art univariate and multivariate statistical techniques
- Actuarial Applications: Insurance loss or claim severity modelling

I have a strong passion for providing statistical consultancy and support to diverse research teams and research-intensive industries, always aiming to contribute meaningful insights and solutions that positively impact people's lives. I am a [Royal Statistical Society \(RSS\)](#) accredited [Chartered Statistician \(CStat\)](#) and a [Statistical Consultant](#), which are formal recognitions of my professional competence and ongoing commitment to continuing professional development throughout my academic and professional career.

EDUCATION:

- | | | |
|---|----------------------------|-------|
| 2018 to 2021 | Cardiff University | UK |
| ▪ PhD in Mathematics
(Specialisation in Infectious Disease Modelling and other biological systems) | | |
| 2016 to 2018 | University of Ghana, Legon | Accra |

- MPhil. Statistics (**GPA: 4.0** out of 4.0)

2011 to 2015

University of Ghana, Legon

Accra

- BSc. Statistics with Mathematics

EMPLOYMENT HISTORY:

Working Experience

- **Senior Medical Statistician (current position)**

September 2023-present

University of Oxford, Nuffield Department of Medicine, Experimental Medicine.

Detailed Oxford University Profile:

<https://www.expmedndm.ox.ac.uk/team/clement-twumasi>

Duties: This is an opportunity to support exciting research (funded by the National Institute for Health Research) to advance understanding of vaccination in chronic disease and aging & approaches for the prevention and treatment of persistent viral infections such as HIV/HBV/HCV. Based at the Medawar Building for Pathogen Research, I work with four Principal Investigators: Professors Eleanor Barnes, John Frater, Paul Klennerman (NDM Experimental Medicine Division) and Professor Susanna Dunachie (Tropical Medicine) on projects within the scope of the ‘Vaccines in Chronic Disease and Aging’ subtheme of the Oxford Biomedical Research Centre theme ‘Life-saving Vaccines.

- As a senior medical statistician, I also provide statistical consultancy services to some research groups within the Oxford University Jenner Institute (i.e., Malaria and GonoVac research groups, respectively) over 30% of my time. I also collaborate with the Oxford Vaccine Group on some research projects/clinical trials.
- I provide comprehensive (one-on-one or group training) expert statistical support and consulting services to research students, postdoctoral researchers, and some principal investigators within the Oxford University NDM (and other Oxford Departments), including assistance with grant applications and supervisory roles to some postgraduate and PhD students.

Profile Interview with NIHR Oxford Biomedical Research Centre (BRC):

<https://oxfordbrc.nihr.ac.uk/dr-clement-twumasi-underpinning-our-research-with-statistical-expertise/>

PS: This position as a Senior Biostatistician/Medical Statistician at Oxford University Department of Medicine coupled with my outstanding academic track record (within and outside the UK), has also helped me to secure/receive the UK’s prestigious [Global Talent Visa](#) for Exceptional Talents. This post at Oxford University (just like my previous post at Imperial College London) is also directly in-line with my future career goals as an academic and a researcher. My current Oxford University profile can be accessed from: [here](#).

- **Full-time Clinical Trials Statistician**

November 2022-September 2023

Imperial College London, School of Public Health | Faculty of Medicine.

Duties: It was an exciting opportunity to be involved in the design and analysis of several Cardiovascular and Respiratory trials (such as MET-FINGER, ON-PACE, PROTECT-HF and NUC-B trials). I developed Statistical Analysis Plan (SAP) in accordance with the Imperial Standard Operating Procedures (SOP) for ongoing clinical trials studies as well as performed high-quality statistical analysis of datasets obtained from these trials over time.

PS: This full-time position at Imperial College was accepted after receiving 3 different offers in a row from **Imperial College London**, **University of Leicester**, and **University of Birmingham** after my postdoctoral studies at the University of Oxford Statistics Department. I accepted the Imperial offer because it involved an important area/clinical trials studies which I wish to develop myself further in accordance with my future career goals.

▪ **Academic Reviewer for top Q1 journals:**

❖ *International Journal of Forecasting*

URL: <https://www.journals.elsevier.com/international-journal-of-forecasting>

❖ *PLOS ONE journal*

URL: <https://journals.plos.org/plosone/s/journal-information>

❖ *PLOS Computational Biology journal*

URL: <https://journals.plos.org/ploscompbiol/>

Duties: For the [International Journal of Forecasting](https://www.journals.elsevier.com/international-journal-of-forecasting) and [PLOS One Journal](https://journals.plos.org/plosone/s/journal-information), I review papers on time-series predictions using state-of-the-art time series models and machine learning techniques (with specific applications to blood supply chain). For [PLOS Computational Biology Journal](https://journals.plos.org/ploscompbiol/), I review works on modelling biological systems and infectious diseases (or mathematical biology).

▪ **Post-doctoral Biostatistics Research Assistant**

April 2022-September 2022 Oxford University Department of Statistics

Duties: This post was connected to a BBSRC-funded research project developing a methodology for deep phenotyping based on latent stochastic processes, with applications in human health, genomics, and ageing. The goal was to provide statistical tools that can keep up with the explosive growth in the availability of high-dimensional genomic and longitudinal data from electronic health records, cohort studies, and biobanks to improve risk prediction, the allocation of health resources, and our fundamental understanding of ageing.

See attached Oxford Statistics Bulletin URL link:

<https://www.stats.ox.ac.uk/statistics-department-bulletin-friday-1-april-2022/>

▪ **Biostatistics Research Assistant (Part-time, 0.4 FTE)**

February 2022-March 2022 Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Science, Oxford University (UK).

Duties: Performed biostatistics research works involving the mathematical modelling of musculoskeletal disorders (specifically, Metabolic bone diseases). I also assisted with teaching in relation to designing clinical research.

▪ **Clement's School on Advanced Data Analysis in R language (Tutor)**

October 2019-Date

Free online class

Cardiff & Oxford, UK

For more information about the class, please visit link below:
<https://piazzacom.clements.school.on.data.analysis/fall2020/ss401/info>

- Guidance and Counselling to young students and researchers, Mathematical & Computing challenge, Football, Reading & Researching, Teaching, Driving, Mathematical Programming, Listening & Dancing to gospel music and helping with community work and supporting other student-led associations.

LEADERSHIP EXPERIENCE, & ACTIVITIES:

- **National President of Ghanaian students in Wales-UK**
2020-2021 National Union of Ghanaian Students Association Wales-UK
- **Student representative**
2019-Present Ghana Union of Wales Wales-UK
- **Acting General Secretary**
2019-2020 National Union of Ghanaian Students Association Wales-UK
- **President**
2014/2015 Asanteman Past Student Association University of Ghana

WORKSHOPS, TRAINING COURSES & CONFERENCES

- Main Speaker for the NIHR Oxford BRC Statistics Hub Lunchtime Seminar: *“Survival analysis techniques in clinical trials – from traditional methods to multi-state Markov modelling approaches”*.
Formal event advertisement link and specific presentation details: [click here](#).
Main slides/Lecture material: [access from here](#).
- Leveraging External Information in Clinical Trials (a professional training course taught by Professor James Wason), Newcastle University (from 28th May to 29th May 2024).
- Adaptive Designs and Multiple Testing Procedures (a professional training course taught by Professor James Wason), Newcastle University (from 11th May to 12th May 2023).
- A novel image from one of my research works was selected by Cardiff University Doctoral Academy towards our annual Image of Research Competition (dated December 7-11, 2020) among PhD students across all disciplines of the university. To view my image with detailed description and novelty, click the link below: <https://twitter.com/ClementMetal/status/1336375913647394817?s=20>
- I was considered as the resource person for a 2-day virtual Academic program organized by National Union of Ghanaian Students in Shanghai-China (NUGS-Shanghai) on statistics & the use of statistical software for academic research (dated November 27-28, 2020). For the links to the 2-day seminar, click below: <https://www.youtube.com/watch?v=SRGpeSYyOoA&t=3463s> (Day 1)
<https://www.youtube.com/watch?v=qqVcYfRkBSk&t=2517s> (Day 2)
- Cambridge University Plus Magazine interview with me over the prestigious Virtual Heidelberg Laureate conference 2020 (<https://www.heidelberg-laureate-forum.org/>). I was also selected among a few PhD students worldwide to present a poster at this prestigious event. Video link to my interview with Cambridge University Plus Magazine is attached below:
<https://plus.maths.org/content/young-researchers-clement-twumasi>
- Three-minute thesis competition among PhD students across all schools of Cardiff University: https://www.youtube.com/watch?v=KXt5RjKfQ_w&t=17s
- Statistics and Computation Conference on Machine Learning sponsored by The Alan Turing Institute and Google: <https://www.turing.ac.uk/events/statistics-and-computation>
- Stochastic Modelling in Health and Disease Conference at School of Mathematics, Leeds University (UK), 11-13th September 2019. I gave a presentation on one of my PhD works entitled “Comparative modelling of parasite population dynamics of two *Gyrodactylus* species”
<https://matml.github.io/smhd2019.html>.
- Second National UK Mathematical Modelling competition held by Manchester University School of Mathematics and Innovate UK using Machine learning for Rare Disease Prediction (26-28th June 2019).
- A 3-day National UK Artificial Intelligence (AI) modelling Challenge sponsored by Cardiff University and Innovate UK was held on 22nd-24th May 2019 (I used

Machine learning algorithms to discover novel findings and knowledge gap on Osteoarthritis prediction during this event)

- Mathematical Models for Infectious Disease Dynamics- [2018] (held at the Wellcome Genome Campus Advance Course, Cambridge- Over 59 hours of training)
- National Taught Course Centre in Operational Research (NATCOR)-UK & MAGIC Maths PhD-level UK course [2019]: **i)** Numerical Methods in Python (by University of East Anglia- 20 hours of training), **ii)** Stochastic Modelling (by Lancaster University- 40 hours of training), and **iii)** Simulation (by Loughborough University- 40 hours of training)
- Bioinformatics and Statistics Training Course- [2018] (held by Cardiff University School of Biosciences- 40 hours of training)
- Cardiff University Doctoral Workshops
- Postgraduate Research Students Seminar/Talks (Cardiff School of Maths)
- UG-Florida Academic Partnership for TB/HIV Research Training

CURRENT

AWARDS:

- Awarded the [Chartered Statistician \(CStat\) status](#) by the [Royal Statistical Society](#) since September 2025 in formal recognition of my professional competence.
- Selected among 200 most exceptional mathematicians and computer scientists worldwide of their generation by international experts for the 8th Heidelberg Laureate Forum, Germany 2021: <https://www.heidelberg-laureate-forum.org/>
- Best/favourite presenter award from a PhD thesis poster presentation in welcoming new first year PhD students in the Cardiff University School of Mathematics on the 1st of October 2019; following an induction and a competition among continuing PhD students within the School of Mathematics.
- Selected as the only student among group of experts during an Innovate UK data analysis competition (in 2019) to serve as an advising data scientist and a statistical consultant for a startup company called AI Rehab Ltd till date: <https://airehab.com/the-team>
- Vice Chancellor's International Scholarship for Research Excellence Award for Doctor of Philosophy of Mathematics, Cardiff University (UK) 2018/2019
- Full-Time Leeds International Doctoral Scholarship (LIDS) Award for PhD in Mathematics, 2018/19
- Nominated for Outstanding Postgraduate Tutor, Cardiff University 2019
- Graduate Student Research Work of the year in Mathematics among all universities in Ghana: GRASAG Excellence Award 2018
- Best MPhil Statistics Student in the Department of Statistics with a GPA of 4.0 out of 4.0, University of Ghana, 2018
- Scholarship award by National Institute for Mathematical Sciences (NIMS) to pursue 2-year master's program in Scientific Computing and Industrial Modelling.
- Diamond (performance) award winner in WASSCE 2011/2012 academic year for Asanteman Secondary School, Kumasi.

PROFESSIONAL SOCIETIES & FELLOWSHIPS:

- [Chartered Statistician \(CStat\)](#), [Statistical Consultant](#), and Fellow of the [Royal Statistical Society \(RSS\)](#)
Membership Number: 231797
PS: The CStat accreditation is the highest professional award of the RSS in formal recognition of member's statistical qualifications and professional competence,.
- Member of [The Oxford Medical Statistics Network \(OxStat\)](#).
Main aim: To facilitate networking, communication and collaboration, and to provide informal support and foster good practice among Oxford University staff and postgraduate students with an interest in medical statistics, working or studying within the Medical Sciences Division.
- Member of the [Society for Mathematical Biology](#) (since March 2024).
Membership Number: 73799161
Other related SMB research highlight: <https://smb.org/news/13344477>.

- [Associate Fellow of the Higher Education Academy \(UK\)](#). A professional teaching recognition awarded on 09/08/2024 by UK's Advance HE.
Fellowship reference: PR297536
- Member of the [Operational Research Society \(UK\)](#).

TECHNOLOGY/ STATISTICAL SOFTWARE:

- R, Python, Graphpad Prism, G*Power software for Power Analysis & Sample Size Calculations, STATA, MATLAB, EVIEWS, GRETL, IBM SPSS, Minitab and LaTeX for scientific report writing as well as beamer presentations.

AREA OF EXPERTISE

- Clinical Trials, Stochastic and Agent-based Modelling, Regression modelling (fixed and random-effect models), Mathematical/Computational Biology, Computational Statistics, Machine Learning, Electronic Health Record (EHR)-wide association studies (EHR-WAS), Proteomics & Genomic Data Analysis, Disease modelling (both deterministic and stochastic class of models), Functional Data Analysis, Machine Learning, Markov Models, Bayesian Networks, Approximate Bayesian Computation, Time series models, Credit Risk Modelling/Credit Scorecard Building, and general statistical analysis (Univariate and Multivariate analyses).

CURRENT RESEARCH FOCUS/PUBLIC ATIONS:

- Predicting Adverse Perinatal Outcomes in Early Onset Pre-Eclampsia Using Competing Machine Learning Methods: Prospective Cohort Study in a Low-Resource Setting (**Publication status:** under peer review in a Q1 journal, submitted to [BJOG: An International Journal of Obstetrics & Gynaecology](#)).
- Uteroplacental Detachment on Transvaginal Ultrasound Predicts Severe Antepartum Hemorrhage and Emergency Cesarean Section in Placenta Previa (**Publication status:** paper accepted in the top-tier [American Journal of Obstetrics & Gynecology](#) (AJOG) journal on October 1, 2025).
- Likelihood-Free Bayesian Estimation of Non-Life Insurance Claim Severity: A Sequential Monte Carlo ABC of the Truncated Composite Lognormal-Pareto Model [**Publication status:** under peer review in a Q1 journal, [Insurance: Mathematics and Economics \(IME\)](#); the largest journal in actuarial science research around the world].
- Novel blood protein signature predictive of T cell vaccine responses after two doses of COVID-19 mRNA vaccine in a UK Healthcare worker cohort (with a Conference paper to be submitted to the [Oxford Immunology Symposium 2025](#) & [International Congress of Immunology 2025](#)).
- Modelling Catastrophic Extinction in Stochastic Birth-Death Process: Analytical Insights, Estimation, and Efficient Simulation (**Publication status:** under review in the [Computational Statistics and Data Analysis](#) Q1 journal).
- Diagnostic ultrasound to inform the surgical approach to cesarean delivery in patients at high risk for placenta accreta spectrum disorders. [American Journal of Obstetrics & Gynecology](#) (AJOG) (**top-ranked Q1 paper, Published on 8th August 2025**).
URL: <https://www.sciencedirect.com/science/article/pii/S0002937825005393>
- Kinetic Pattern Recognition in Home-Based Knee Rehabilitation Using Machine Learning Clustering Methods on the Slider Digital Physiotherapy Device: Prospective Observational Study. [Journal of Medical Internet Research](#) (JMIR) *Formative Research* (**Published on 18th March 2025**).
URL: <https://formative.jmir.org/2025/1/e69150/>
- Mathematical modelling of parasite dynamics: stochastic simulation-based approach and parameter estimation via modified sequential-type approximate Bayesian

computation. *Bulletin of Mathematical Biology* (Q1 journal, Published- 10th April 2024).

URL: <https://link.springer.com/article/10.1007/s11538-024-01281-5>

- Determinants of durable humoral and T cell immunity in myeloma patients following COVID-19 vaccination. *European Journal of Haematology* (Q1 journal; Published- 20th December 2023).
URL: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/ejh.14143>
- In *Silico* Modelling of Parasite Dynamics (PhD Thesis, Cardiff School of Mathematics, UK)- **PhD Thesis completed and successfully defended. Cardiff University ORCA URL:** <https://orca.cardiff.ac.uk/id/eprint/150632/>
- Spatial and Temporal Parasite Dynamics: Microhabitat preferences and infection progression of two co-infecting gyrodactylids. *Parasites & Vectors* (Q1 Springer Nature) Journal (Published- 24th September, 2022).
URL: <https://doi.org/10.1186/s13071-022-05471-9>
- Machine Learning Algorithms for Forecasting and Backcasting Blood Demand Data with Missing Values and Outliers: A Study of Tema General Hospital of Ghana. *International Journal of Forecasting* (Q1 journal; Published- 31st December, 2021).
URL: <https://www.sciencedirect.com/science/article/pii/S0169207021001710>
- An Experimental Study of Lesions Observed in Bog Body Funerary Performances. *Experimental Archaeology Journal* (Published- 26th August, 2021). URL: <https://exarc.net/ark:/88735/10595>
- Markov Modelling of HIV, Tuberculosis and Hepatitis B Transmission: A Study of a Regional Hospital in Ghana. *Interdisciplinary Perspectives on Infectious Diseases*. (Published-20th November, 2019).
URL: <https://doi.org/10.1155/2019/9362492>
- Statistical Modelling of HIV, Tuberculosis and Hepatitis B Transmission in Ghana. *Canadian Journal of Infectious Diseases and Medical Microbiology* (Published-24th December, 2019).
URL: <https://doi.org/10.1155/2019/2697618>
- Modelling the Transmission Dynamics of Tuberculosis in the Ashanti Region of Ghana. *Interdisciplinary Perspectives on Infectious Diseases* (Published-31st March, 2020). URL: <https://doi.org/10.1155/2020/4513854>

PS: There are several ongoing research projects currently in progress or about to be submitted for peer-review publication.

CURRENT/ ONGOING RESEARCH & GRANT APPLICATIONS:

- **RD Lawrence Fellowship Full Application (Reference: 6362):** Predictors and drivers of immunocompetence in type 2 diabetes mellitus.
Lead University: University of Oxford **Role:** Co-applicant/Senior Medical Statistician
- **NIHR EME/Postdoctoral awards (NIHR508483):** Using human challenge to assess efficacy and mechanism of protection of 4CMenB against gonorrhoea.
Lead University: University of Oxford **Role:** Co-applicant/Medical Statistician
- **MRC Grant Application Number (APP83698):** Phase 1 first-in-human study of a gonococcal outer membrane vesicle vaccine to prevent gonorrhoea and reduce antimicrobial resistance.

Lead University: University of Oxford **Role:** Specialist (Medical Statistician)

- **MRC Grant Application Number (APP67893):** Analytical treatment interruption to boost T-cell-mediated cure/remission in children living with HIV: a mechanistic study.

Lead University: University of Oxford **Role:** Specialist (Medical Statistician)

- **MRC Grant Application Number (APP76421):** The impact of early CMV acquisition, HIV exposure and early life immune sex differences on immune outcomes in Sub-Saharan African children.

Lead University: University of Oxford **Role:** Specialist (Medical Statistician)

- **Grant Application (Gates Foundation):** *Development and Validation of clinical model for preeclampsia management* (ID: 0000000464). **Program:** Reducing the Burden of Preeclampsia.

Lead University: University of Oxford **Role:** Senior Statistician

- **MRC Grant Application Number (APP45524):** *Phase IIa Study: Impact of bnAb VRC07-523LS with ART on HIV Virological Control via Analytical Treatment Interruption in Very Early-Treated Children*

Opportunity: OPP557: MRC: Jul 2024: stage one: developmental pathway funding scheme.

Lead University: University of Oxford **Role:** Specialist (Statistician)

- **MRC Grant Application Number (APP38125):** *Vaccines for Anti-Microbial resistance Pathogens (VAMP): defining target antigens and human immunity to Escherichia coli and Klebsiella pneumoniae*

Opportunity: OPP482: MRC: Infections and immunity: research grant: May 2024: responsive mode.

Lead University: University of Oxford **Role:** Specialist (Medical Statistician)

- **MRC Grant Application Number (APP31993):** *Utilising the Controlled Human Infection Model to de-risk Neisseria gonorrhoea vaccine development and understand immune responses to gonorrhoea*

Opportunity: OPP381: MRC: developmental pathway funding scheme: stage one: Mar 2024.

Lead University: University of Oxford **Role:** Specialist (Medical Statistician)

- **AbVax clinical trial:** *Combination Vaccination and Broadly Neutralising Antibody Therapy in HIV to induce a protective T cell 'vaccinal effect' - a randomised phase II clinical trial.*

Sponsor: University of Oxford

Role: Trial Statistician

- **COVCHIM01 clinical trial:** *A phase I, experimental dose finding, open label, clinical infection, safety and viral detection optimisation in previously SARS-CoV-2 infected (unvaccinated or vaccinated) or uninfected vaccinated volunteers.*

Sponsor: University of Oxford

Role: Senior Statistician & Co-author

REFREES:

- Professor Ellie Barnes
Address: Nuffield Department of Medicine, Experimental Medicine Division
Peter Medawar Building for Pathogen Research, OX1 3SY, UK.
Email: ellie.barnes@ndm.ox.ac.uk
- Professor David Steinsaltz
Address: Department of Statistics, University of Oxford, 24-29 St Giles',
Oxford, OX1 3LB, UK.

Email: steinsal@stats.ox.ac.uk/ david.steinsaltz@worc.ox.ac.uk

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