ORTIS YANKEY, Ph.D.

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Professional Summary

I am a geospatial modeller with over five years of experience applying advanced statistical, machine learning, and geospatial techniques to real-world challenges. I have proven expertise in using R, Geographic Information System (GIS), and Bayesian frameworks for population modelling, food environment research, and public health outcomes. I have gained experience in engaging stakeholders and enhancing their capacity in both national and international projects.

Key Skills

- **Software & Analytics:** Advanced proficiency in using R, SAS, and SPSS for data analysis.
- **Domain Expertise:** Machine learning, advanced statistics, Bayesian statistics, Spatial statistics
- **Machine learning:** Supervised and unsupervised classification, ensemble learning, and artificial neural networks
- **Advanced Statistics:** Regression models, Bayesian Modelling, model validation, and uncertainty quantification.
- **Geospatial Analytics:** ArcGIS Pro, QGIS, Geoda, ENVI, Remote Sensing, Spatial Statistics
- **IT Skills:** Workflow deployment in high-performance computers, knowledge of GitHub
- **Project Leadership & Collaboration:** Interdisciplinary research, stakeholder engagement, technical training

Education

Ph.D. in Geography   May 2022
Kent State University, Ohio, USA

M.Sc. Geographic Information System (GIS)   May 2018
The University of Akron, Ohio, USA

M.Sc. Urbanisation and Development   October 2015
The London School of Economics and Political Science (LSE)

B.Sc. Land Economy   May 2013
Kwamen Nkrumah University of Science and Technology, Ghana

Professional Experience

Research Fellow   January 2022 - Current
WorldPop Research Group, University of Southampton, UK
Responsibilities

- Lead and co-develop machine learning and Bayesian statistical models to estimate population and demographic indicators at small area scales.
- Develops advanced statistical models for predicting health outcomes at smaller geographic

scales.
- Conducting simulation studies to ascertain model validity and replicability
- Integrate census, survey, and earth observation data for spatial analysis and predicting health outcomes.
- Deliver training to national statistical offices on data science workflows and population modelling using R and GIS.

Graduate Teaching Assistant/Ph. D. Researcher   August 2018 – January 2022
Kent State University, OH USA, Department of Geography

Responsibilities

- Built Bayesian spatial models for urban food environments analysis.
- Conducted literature reviews, questionnaire design, and manuscript preparation.
- Taught undergraduate students' various courses
- Organized lab work and tutorial sessions for these classes.
- Organized quizzes and exams.
- Graded submitted test materials.
- Held office hours for students.

Graduate Teaching Assistant   August 2016 – May 2018
The University of Akron, OH USA, Department of Geosciences
Responsibilities
- Assisted students with their GIS tutorials and lab assignments.
- Proctored exams and assisted with the grading of tests.
- Helped students with their data analysis using statistical software such as R and SPSS

Research Internships
NEAP, Case Western University (2019): Surveyed and analyzed food retail environments data
Summit County Public Health, Ohio (2017): Analyzed mental health incident data in the city of Akron in Ohio

Research Interest

- Spatial Epidemiology (Health Geography)
- Spatial Demography (Population modelling)
- Spatial Statistics
- Bayesian Spatial and Spatiotemporal Models

Research Experience

Research Fellow   January 2022 - Current
WorldPop Research Group, University of Southampton
Key Projects and Roles:
- **Estimation of Populations Targeted for Vaccination in Cameroon**—*Lead Modeller*
  Led geospatial modelling to estimate children targeted for vaccination campaigns using microcensus and geospatial data. *(2025 output planned)*

- **Adjusting for Census Undercount in Jamaica** – *Lead Modeller*
  Developed a statistical model to improve national population estimates by correcting for undercounts. *(2025)*
- **Gridded Population Modelling for DRC Vaccination Campaigns** – *Co-lead Modeller*
  Coordinated data integration and spatial modelling of population count to support national vaccine planning. *(2024)*
- **Geospatial Modelling of Vaccine Coverage in Nigeria** – *Co-lead Modeller*
  Applied Bayesian and machine learning approaches to compare estimates of vaccine coverage. *(2024)*
- **Top-down Population Modelling Using Bayesian Methods** – *Lead Modeller*
  Developed a Bayesian machine learning approach for census disaggregation. *(2023)*
- **Population Estimates for Cameroon Using Hierarchical Geostatistical Models** – *Co-lead*
  Implemented advanced Bayesian modelling techniques for subnational population estimation. *(2022)*

Ph. D. Researcher   August 2018 – January 2022
  Kent State University, OH USA
  Thesis:
- Examining the Effect of Neighborhood Segregation and Socioeconomic Factors on the Food Environment: A Bayesian Hierarchical Spatial Analysis Using INLA

Master's Student   August 2016 – January 2022
  The University of Akron, OH USA
Thesis:
- Using Geostatistics to Predict Soil Lead Distribution in Akron and Implications for Urban Gardens.

Teaching Experience

Courses taught
- Instructor of Record, World Geography (Fall 2021), Kent State University
- Instructor of Record, Introduction to Geography (Spring, 2021), Kent State
- Instructor of Record, Introduction to GIS (Fall 2020), Kent State University
- Instructor of Record, Advanced GIS (Spring 2020), Kent State University
- Teaching Assistant, Geography of Wine (Fall 2019), Kent State University
- Instructor of Record, Physical Geography Lab (Spring 2019), Kent State University
- Instructor of Record, Introduction to Geography (Fall 2018), Kent State University
- Teaching Assistant, Spatial Analysis (Spring 2018), University of Akron
- Teaching Assistant, Introduction to GIS (Fall 2017), University of Akron
- Teaching Assistant, Cultural Geography (Spring 2017), University of Akron
- Teaching Assistant, Cultural Geography (Fall 2017), University of Akron

Training and Workshops Conducted
- Introduction to R for Statistical Analysis – Postgraduate Students, University of Southampton, February 2024 and May 2025

- Bottom-up Gridded Population Modelling Workshop – Statistical Institute of Jamaica
  March 2025
- Gridded Population Modelling Workshop – Cameroon National Statistical Office (NSO)
  April 2024
- Spatial Population Modelling Training – Thailand National Statistical Office
  November 2023
- Modelled Population Estimates and National Sampling Frames – Training for census teams and
  NSOs across Latin America and the Caribbean June 2023
- Capacity-Strengthening Workshop on Population Modelling – Nigeria Population Commission
  February 2023

Publications

1. Dotse-Gborgbortsi, W., Nilsen, K., **Yankey, O.,** Ofosu, A., Ankomah, T., Tweneboah, E., ... & Wright, J. (2025). Spatio-temporal patterns of health service delivery and access to maternal, child, and outpatient healthcare in Volta region, Ghana: a repeated cross-sectional ecological study using health facility data. *Global Health Action*, *18*(1), 2513861.

2. Nnanatu, C. C., Bonnie, A., Joseph, J., **Yankey, O.,** Cihan, D., Gadiaga, A., ... & Tatem, A. J. (2025). Estimating small area population from health intervention campaign surveys and partially observed settlement data. *Nature Communications*, *16*(1), 1-13.

3. **Yankey, O.,** Essah, M., & Amegbor, P. M. (2025). The COVID-19 pandemic and self-reported food insecurity among women in Burkina Faso: evidence from the performance monitoring for action (PMA) COVID-19 survey data. *BMC Women's Health*, *25*(1), 42.

4. **Yankey, O.,** Utazi, C. E., Nnanatu, C. C., Gadiaga, A. N., Abbot, T., Lazar, A. N., & Tatem, A. J. (2024). Disaggregating Census Data for Population Mapping Using a Bayesian Additive Regression Tree Model. Applied Geography, Volume 172(103416), https://doi.org/10.1016/j.apgeog.2024.103416.

5. Buckman, T. A., Sakyi, S. A., Yeboah-Mensah, K., Antwi, M. H., Darban, I., Owusu-Brenya, L., & **Yankey O**. (2024). Demographic, Clinical Profile of Rheumatoid Arthritis Patients and Their Association with Disease Severity in Ghana. *International Journal of Rheumatology*, *2024*.

6. **Yankey, O.,** Lee, J., Gardenhire, R. & Borawski E (2023). Neighborhood Racial Segregation Predict the Spatial Distribution of Supermarkets and Grocery Stores Better than Socioeconomic Factors in Cleveland, Ohio: a Bayesian Spatial Approach. *J. Racial and Ethnic Health Disparities*. https://doi.org/10.1007/s40615-023-01669-4

7. Botchwey, G., & **Yankey, O.** (2023). Small-Scale Mining, Environment and Livelihoods: Perspectives from Mining Communities in Ghana. *African Journal of Social Sciences Education*, *2*(2).

8. **Yankey, O.**, Amegbor, P. M., & Lee J. (2021). The Effect of Sociodemographic Factors on the Risk of Poor Mental Health in Akron (Ohio): A Bayesian Hierarchical Spatial Analysis. *Journal of Spatial & Spatiotemporal Epidemiology, 100438. https://doi.org/10.1016/j.sste.2021.100438*

9. **Yankey O.,** Amegbor, P. M., & Essah M. (2021). The Effect of Socioeconomic and Environmental Factors on Obesity: A Spatial Regression Analysis. *International Journal of*

Applied Geospatial Research (IJAGR)

10. Amegbor, P.M., **Yankey, O**., Davies, M. & Sabel, C. E. (2021). Individual and contextual predictors of overweight or obesity among women in Uganda: a spatio-temporal perspective. Geojournal. https://doi.org/10.1007/s10708-021-10466-7

11. Amegbor, P. M**., Yankey, O**., & Sabel, C. E. (2020). Examining the effect of geographic region of residence on childhood malnutrition in Uganda. *Journal of tropical pediatrics,* 66(6), 598-611.

12. Amegbor, P. M., **Yankey, O**., Rosenberg, M. W., & Sabel, C. E. (2020). Examining spatial variability in the association between male partner alcohol misuse and intimate partner violence against women in Ghana: a GWR analysis. *Journal of interpersonal violence*, 0886260519900299.

Book Chapter

13. **Yankey, O.,** Hu T, Yue H, Wang P, Xu X. (2023). Spatiotemporal Bayesian Regression. A book chapter in Spatiotemporal Analytics. CRC Press, Tailor & Francis Group

14. WorldPop. 2024. WorldPop Book of Methods, Vol. I: Gridded Population Estimates. WorldPop, University of Southampton. 08 October 2024 (https://wpgp.github.io/bookworm/)

Manuscript Under Review/Pre-Prints

- Boo, G., Darin, E., Chamberlain, H. R., Hosner, R., Akilimali, P. K., Kazadi, H. M., **Yankey O.,** & Tatem, A. J. (2025). Tackling public health data gaps through Bayesian high-resolution population estimation: a case study of Kasaï-Oriental, Democratic Republic of the Congo. *VeriXiv*, *2*(8), 8.
- Nnanatu, C. C., **Yankey, O.,** Dzossa, A. D., Abbott, T., Gadiaga, A., Lazar, A., & Tatem, A. (2025). Efficient Bayesian hierarchical small area population estimation using INLA-SPDE: integrating multiple data sources and spatial-autocorrelation.
- Utazi, C., **Yankey, O.,** Chaudhuri, S., Olowe, I., Danovaro-Holliday, C., Lazar, A., & Tatem, A. (2024). Geostatistical and Machine Learning Approaches for High-Resolution Mapping of Vaccination Coverage.

Conference Presentations

1. **Yankey, O.** (presenting author), Nnanatu, C. C., Gadiaga, T., Lazar, A. N., & Tatem, A. J. (2025). Innovative Approaches to Population Modelling: A Case Study of the DRC. American Association of Geographers Annual Conference, Detroit, 2025

2. **Yankey, O.** (presenting author), Utazi, C. E., Nnanatu, C. C., Gadiaga, A. N., Abbot, T., Lazar, A. N., & Tatem, A. J. (2024). Disaggregating Census Data for Population Mapping Using a Bayesian Additive Regression Tree Model. GISRUK Conference, Leeds, 2024

3. **Yankey, O**. (presenting author), Amegbor, P. M., & Lee J. (2021). The Effect of Sociodemographic Factors on the Risk of Poor Mental Health in Akron (Ohio): A Bayesian Hierarchical Spatial Analysis. Healthy Communities Research Initiative, Kent State University, March 8-9, 2021. *Moved to virtual due to COVID 19

4. Amegbor, P. M., **Yankey, O** (presenting author), & Sabel, C. E. (2020). Examining the effect of geographic region of residence on childhood malnutrition in Uganda. Association of American Geographers Annual Meeting, Denver (Colorado) April 4-10, 2020. *Moved to virtual due to COVID 19

5. Amegbor, P. M., **Yankey, O**. (presenting author), Rosenberg, M. W., & Sabel, C. E. (2020). Examining spatial variability in the association between male partner alcohol misuse and intimate

partner violence against women in Ghana: a GWR analysis. Association of American Geographers Annual Meeting, Washington-D.C, April 3-7, 2019

6. Yankey O.(Poster Presentation) Using Geostatistics to Predict Soil Lead Distribution in Akron (Ohio), and Implications for Urban Gardens. Association of American Geographers Annual Meeting, New Orleans (Louisiana), April 9-14, 2018

Grants

Dates	Role	Title	Funding Body	Value
January, 2024	Co-Investigator	Estimation of populations targeted for vaccination through geospatial modelling	GAVI, the vaccine alliance	$35,919

Awards and Recognition

- Commonwealth Shared Scholarship (LSE, UK)
- Graduate Assistantships (Kent State and University of Akron, USA)
- African Community Scholarship for Academic Excellence (Kent State, 2019)

Affiliations

- American Association of Geographers, USA
- The Association for Geographic Information, UK
- Commonwealth Scholars Network, UK

Reviewer

- Journal of Racial and Ethnic Health Disparities
- PLOS ONE
- Journal of Health, Population and Nutrition
- Papers in Applied Geography

References

Will be provided upon request