Belay B. Yimer

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Education

Hasselt University   *Hasselt, Belgium*

PhD in Statistics   *Oct 2021*

- **Thesis:** Analysis of infectious disease data: A Flexible Bayesian Statistical Modeling Approach
- Supervisor: Prof Ziv Shkedy

Jimma University   *Jimma, Ethiopia*

MSc in Biostatistics   *Sept 2011*

- Graduated with Distinction
- **Thesis:** Comparison of Cox and frailty models for clustered time-to-event data
- Main modules: Epidemiology, Clinical Trial, Design of Experiment, Survival Analysis, Longitudinal models, Principles of Statistical Inference, Computer Intensive Methods

Hawassa University   *Hawassa, Ethiopia*

BSc in Applied Statistics   *July 2008*

- Graduated with Distinction

Work Experience

Center for Epidemiology, University of Manchester   *Manchester, Uk*

Biostatistician/Research Associate   *Sep 2017 - Present*

- Developed robust statistical analysis plans, including scalable solutions to analysis challenges posed by the type and structure of the data, for multiple projects
- Led in-house statistical training by delivering lectures, seminars, and workshops
- Contributed to the development of the centre's funding proposals, securing over £200k as a co-applicant

Jimma University   *Jimma, Ethiopia*

Lecturer   *Sept 2011 - Sept 2017*

- Lecturer for Principles of statistical inference course and co-lecturer Survival analysis course for graduate students in Biostatistics
- Supervision of student thesis both at undergraduate and graduate level (5 MSc student thesis supervision completed)
- Led two VLIR-UOS funded capacity building projects between 2014 and 2017

Selected Projects

Cloudy with a chance of pain: a smartphone-based study to investigate the association between pain and the weather

University of Manchester

- The study recruited more than 13,000 participants and recorded daily pain severity on a 5-point scale (range: no pain to very severe pain) along with hourly GPS location data to be linked with weather data for up to 15 months.
- We established the link between weather and pain at the population level as well as demonstrated the heterogeneity in weather-pain association at the individual level
- **Role:**
  - Developed an algorithm that links the hourly GPS data to the nearest weather station within a 100 KM radius and downloads weather data from NOAA's Integrated Surface Database (ISD)
  - Developed a significant location imputation approach for handling missing hourly GPS data based on Hartigan's clustering leader algorithm
  - First authored one and co-authored three publications

Quality of life and sleep in Rheumatoid Arthritis (QUSAR): mHealth study aimed to test whether sleep disturbance (both absolute values and variability) causes poor HRQoL

University of Manchester

- Over 250 participants wore a triaxial accelerometer for 30 days to objectively assess sleep, and provided daily reports via a smartphone app that assessed sleep (Consensus Sleep Diary), pain, fatigue, mood, and other symptoms.
- We showed sleep predicts poor HRQoL independent of disease severity.
- **Role:**
  - Led the development of the statistical analysis plan, prepared the data, and conducted the analysis.
  - Published one paper as a joint last author and Co-authored one (under review in BMC Rheumatology)

Opioid comparative safety and utilization

University of Manchester

- We studied 1,968,742 new opioid users without cancer from primary care electronic health records across the UK and identified factors associated with long-term use.
- **Role:**
    - Led the development of the statistical analysis plan, prepared the data, and conducted the analysis.
    - Co-authored one publication and secured a follow-up funding as a co-applicant

Awards

Risk stratification of patients with multi-morbidity at risk of COVID-19 associated adverse outcomes in Greater Manchester, Turing-UoM Sandpit: AI and Data Science for Translational Digital Health, 2022, £14,000 , Co-applicant

Trends and factors associated with prescription opioid utilization, dependence and deaths in patients with musculoskeletal conditions, FOREUM Foundation for Research in Rheumatology, 2020, 200,000 (Euro), co-applicant

Travel grant, rstudio::conf(2022), annual RStudio conference, Washington, USA, 2022, $1500.00 plus accommodation

Statistics for development: capacity building in statistics at higher education in Ethiopia, VLIR-UOS, 2017, €119, 869, co-applicant

Statistics for development: capacity building in statistics at higher education in Ethiopia, VLIR-UOS, 2016, €58, 476, co-applicant

Selected Talks at International conferences

Causal mediation analysis using Stan – a g-formula approach, Royal statistical society, September 6-9, 2021, Manchester, UK, slide

Short-term forecasting of total number of reported COVID-19 cases in South Africa - A Bayesian temporal modelling approach, The Sub-Saharan Africa Network (SUSAN) of the International Biometrics Society, September 5-9 (virtual), 2021, Kenya. slide

Bayesian variable selection for order restricted Dose-response modelling: Model Selection and Complexity, Annual Conference of The Belgian Statistical Society, October 13-14, 2016, Namur, Belgium, slide

Bayesian Model averaging in longitudinal studies using Bayesian variable selection methods, Ethiopian Statistical Association, May 20-22, 2016, Addis Ababa, Ethiopia

Model selection and Multimodal inference in longitudinal studies using Bayesian variable selection methods, International Conference on Applied Statistics in Agriculture, 25-26 March 2016, Haramaya, Ethiopia

Evaluating Durability of First-line cART using Multi-State survival model, an International Conference on Statistics-2015: Theory to Practice, March 16-18, 2015, Jimma University, Ethiopia

Publications

Software
   BayesGmed: R package for Bayesian Causal Mediation Analysis using Stan, Github

   drugprepr: R package for the transparent and efficient preparation of CPRD drug data into information on individuals' drug use over time, CRAN

   doseminer: R package for extracting Drug Dosages from Free-Text Prescriptions, CRAN

Preprints
   Das, R., Muldoon, M., Lunt, M., McBeth, J., **Yimer, B. B.**, & House, T. (2022). Modelling and classifying joint trajectories of self-reported mood and pain in a large cohort study. arXiv preprint arXiv:2209.15553.

   Yimer, B. B., Lunt, M., Beasley, M., Macfarlane, G. J., & McBeth, J. (2022). BayesGmed: An R-package for Bayesian Causal Mediation Analysis. arXiv preprint arXiv:2210.08499.

   Williams, R. D., Reps, J. M., Sena, A. G., Burn, E., He, Y., Morales, D. R., ... & Prieto-Alhambra, D. (2020). Development and validation of patient-level prediction models for adverse outcomes following total knee arthroplasty. medRxiv, 2020-12.

Methodology	Jani, M., **Yimer, B. B.**, Selby, D., Lunt, M., Nenadic, G., & Dixon, W. G. (2023). " Take up to eight tablets per day": Incorporating free-text medication instructions into a transparent and reproducible process for preparing drug exposure data for pharmacoepidemiology. Pharmacoepidemiology and Drug Safety. https://doi.org/10.1002/pds.5595
	Yimer, B. B., & Shkedy, Z. (2021). Bayesian inference for generalized linear mixed models: A comparison of different statistical software procedures. RMS: Research in Mathematics & Statistics, 8(1), 1896102.
	Yimer, B. B., Otava, M., Degefa, T., Yewhalaw, D., & Shkedy, Z. (2021). Bayesian model averaging in longitudinal studies using Bayesian variable selection methods. Communications in Statistics-Simulation and Computation, 1-18.
	Aniley, T. T., Debusho, L. K., Nigusie, Z. M., Yimer, W. K., & **Yimer, B. B.** (2019). A semi-parametric mixed models for longitudinally measured fasting blood sugar level of adult diabetic patients. BMC medical research methodology, 19, 1-11.
	Yimer, B. B.,, Braekers, R., Awoke, T., Kasim, A., & Shkedy, Z. (2017). Multi-state models for the analysis of time-to-treatment modification among HIV patients under highly active antiretroviral therapy in Southwest Ethiopia. BMC infectious diseases, 17(1), 1-13.
	Negash, Y., Kassahun, W., Gurmessa, A., & **Yimer, B. B.** (2016). Joint modeling of longitudinal systolic and diastolic blood pressure measurements of hypertensive patients receiving treatment. Electronic Journal of Applied Statistical Analysis, 9(2), 308-325.
	Banbeta, A., Seyoum, D., Belachew, T., **Yimer, B. B.**, & Getachew, Y. (2015). Modeling time-to-cure from severe acute malnutrition: application of various parametric frailty models. Archives of Public Health, 73(1), 1-8.
	Seid, A., Getie, M., **Yimer, B. B.**, & Getachew, Y. (2014). Joint modeling of longitudinal CD4 cell counts and time-to-default from HAART treatment: a comparison of separate and joint models. Electronic Journal of Applied Statistical Analysis, 7(2), 292-314.
Application	**Yimer, B. B.**, Schultz, D. M., Beukenhorst, A. L., Lunt, M., Pisaniello, H. L., House, T., ... & Dixon, W. G. (2022). Heterogeneity in the association between weather and pain severity among patients with chronic pain: a Bayesian multilevel regression analysis. Pain reports, 7(1).
	McBeth, J., Dixon, W. G., Moore, S. M., Hellman, B., James, B., Kyle, S. D., ... , **Yimer, B. B.** & Druce, K. L. (2022). Sleep disturbance and quality of life in rheumatoid arthritis: prospective mHealth study. Journal of Medical Internet Research, 24(4), e32825.
	Druce, K. L., Gibson, D. S., McEleney, K., **Yimer, B. B.**, Meleck, S., James, B., ... & McBeth, J. (2022). Remote sampling of biomarkers of inflammation with linked patient generated health data in patients with rheumatic and musculoskeletal diseases: an Ecological Momentary Assessment feasibility study. BMC Musculoskeletal Disorders, 23(1), 770.
	Beukenhorst, A. L., Sergeant, J. C., Schultz, D. M., McBeth, J., **Yimer, B. B.**, & Dixon, W. G. (2021). Understanding the predictors of missing location data to inform smartphone study design: observational study. JMIR mHealth and uHealth, 9(11), e28857.
	Jani, M., **Yimer, B. B.**, Sheppard, T., Lunt, M., & Dixon, W. G. (2020). Time trends and prescribing patterns of opioid drugs in UK primary care patients with non-cancer pain: a retrospective cohort study. PLoS medicine, 17(10), e1003270.
	Burn, E., You, S. C., Sena, A. G., Kostka, K., Abedtash, H., Abrahão, M. T. F., ... & Ryan, P. (2020). Deep phenotyping of 34,128 adult patients hospitalised with COVID-19 in an international network study. Nature communications, 11(1), 5009.
	Costello, R. E., **Yimer, B. B.**, Roads, P., Jani, M., & Dixon, W. G. (2021). Glucocorticoid use is associated with an increased risk of hypertension. Rheumatology, 60(1), 132-139.
	Schultz, D. M., Beukenhorst, A. L., **Yimer, B. B.**, Cook, L., Pisaniello, H. L., House, T., ... & Dixon, W. G. (2020). Weather patterns associated with pain in chronic-pain sufferers. Bulletin of the American Meteorological Society, 101(5), E555-E566.
	Dixon, W. G., Beukenhorst, A. L., **Yimer, B. B.**, Cook, L., Gasparrini, A., El-Hay, T., ... & McBeth, J. (2019). How the weather affects the pain of citizen scientists using a smartphone app. NPJ digital medicine, 2(1), 105.
	Habtamu, T., Bekele, A., Ahmed, R., Gadisa, T., Birlie, B., Tolemariam, T., & **Yimer, B. B.** (2017). Diets of the African Civet Civettictis civetta (Schreber, 1778) in selected coffee forest habitat, south-western Ethiopia. African Journal of Ecology, 55(4), 573-579.
	Seyoum, D., Degryse, J. M., Kifle, Y. G., Taye, A., Tadesse, M., **Yimer, B. B.**, ... & Speybroeck, N. (2017). Risk factors for mortality among adult HIV/AIDS patients following antiretroviral therapy in Southwestern Ethiopia: an assessment through survival models. International journal of environmental research and public health, 14(3), 296.
	Awoke, T., Worku, A., Kebede, Y., Kasim, A., **Yimer, B. B.**, Braekers, R., ... & Shkedy, Z. (2016). Modeling outcomes of first-line antiretroviral therapy and rate of CD4 counts change among a cohort of HIV/AIDS patients in Ethiopia: a retrospective cohort study. PloS one, 11(12), e0168323.
	Yimer, B. B., Diriba, T., Sisay, K., Gurmessa, A., Seyoum, D., & Tadesse, M. (2016). Mother to child HIV transmission and its predictors among HIV-exposed infants: a retrospective follow-up study in Southwest Ethiopia. J AIDS Clin Res, 7(605), 2.
	Degefa, T., Zeynudin, A., Godesso, A., Michael, Y. H., Eba, K., Zemene, E., ... & Yewhalaw, D. (2015). Malaria incidence and assessment of entomological indices among resettled communities in Ethiopia: a longitudinal study. Malaria journal, 14(1), 1-11.
	Hamu, H., Debalke, S., Zemene, E., **Yimer, B. B.**, Mekonnen, Z., & Yewhalaw, D. (2014). Isolation of intestinal parasites of public health importance from cockroaches (Blattella germanica) in Jimma Town, Southwestern Ethiopia. Journal of Parasitology Research, 2014.

Teaching

Bias and confounding - Introduction to Epidemiology, Genetic Epidemiology, and Biostatistics course, center for epidemiology, University of Manchester, 2021 & 2022 academic year.

Longitudinal data analysis - Applied Epidemiology and Biostatistics course, center for Epidemiology, University of Manchester, 2022 academic year.

Principles of statistical inference, MSc in Biostatistics program, Jimma University, course led 2014 - 2016 academic years, course material

Survival analysis, MSc in Biostatistics program, Jimma University, Co-lecturer, 2014 academic year

Bayesian Statistics, MSc in Biostatistics program, invited lecture, Gondar University, May 22 - 25, 2017 , course syllables

Infectious disease modelling, MSc in Biostatistics program, invited lecture, Gondar University, May 29 - Jun 02, 2017.

Leadership and service

Centre for Epidemiology Versus Arthritis representative for the UK Research in Musculoskeletal Epidemiology (UK-RiME) partnership, 2019 - present

Strategic management team member, Center for Epidemiology, University of Manchester, 2020 - present

Seminar organiser for the Biostatistics forum, Centre for Epidemiology Versus Arthritis, 2020 - present

Organising committee for the R-user group, University of Manchester and Metropolitan University of Manchester, 2019 - 2022

References available upon request.