Latera Tesfaye Olana

Contact

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Education

Health Metrics Sciences

MSc in Health Metrics Sciences at University of Washington: 09/2022 – 08/2023

PhD student in Health Metrics Sciences at University of Washington: starting from 10/2023

Computer Engineering

BSc in Computer Engineering from Addis Ababa Institute of Technology, Addis Ababa University: 02/2014 – 08/2019

Professional experience

National Data Management Center for health (NDMC) at Ethiopian Public Health Institute (EPHI)

A case team lead for Data Analytics, Modelling and Visualization unit: 11/2019 – 09/2022

- Applied data science, Machine Learning (ML)/Artificial Intelligence (AI), big data analytics on health data, for fostering and enriching public health intelligence.
- Maximized the use and utilization of local health datasets through the generation of extensive data quality assessment reports and guidelines.
- Provided innovative and robust computational and visualization approaches for high-dimensional health data through the identification, design, development, and execution of several analytical platforms that fit multiple data sources.

Federal Ministry of Health

COVID-19 Modelling for National Pandemic Preparedness: 03/2020 - 06/2022

- Developed numerous mathematical models on COVID-19 to understand the progression and the impact of certain or sets of intervention policies and scenarios on the epidemic trajectory.
- Created platforms for rapid characterization and estimation of the magnitude of COVID-19, disease severity, and mortality differential.

Harvard T.H. Chan School of Public Health

Data Mining and Big Data Analytics for Health System Strengthening (Visiting Scientist): 04/2022 - 08/2022

- The use of advanced data analytics methods to model and measure the effectiveness of health interventions from a heterogeneous and large data perspective

University of Washington, Institute for Health Metrics and Evaluation

Graduate Research Assistantship: 09/2022 - present

- Data analysis, methods development and analytic support to a given research team
- Contributions to manuscript preparation for peer-reviewed publications

Quantium Health SA (Pty), Ministry of Health and Ethiopian Public Health Institute

Health Data Scientist: 01/2022 - 09/2022

- An evidence-based approach to COVID-19 vaccine delivery optimization in Ethiopia
- Develop a detailed population model for Ethiopia at a granular geographic level
- Develop a model for practical implementation of Ethiopia's COVID-19 vaccine rollout

Participation on national projects from funders

- Bill and Melinda Gates Foundation (BMGF), funded through Quantium Health SA (Pty), to support Ministry of Health in COVID-19 vaccine rollout

- Bill and Melinda Gates Foundation (BMGF), funded through Institute for Health Metrics and Evaluation and Ethiopian Public Health Institute, subnational burden of disease estimation project

- World Bank through Africa CDC Regional Investment Financing: project to strengthen regional infectious disease detection and response systems

- **COVID-19 Excess Mortality Collaborators:** Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–21 Lancet (2022)
- **Covid-19 National Preparedness Collaborators:** Pandemic preparedness and covid-19: an exploratory analysis of infection and fatality rates, and contextual factors associated with preparedness in 177 countries, from Jan 1, 2020, to Sept 30, 2021. Lancet (2022)
- **COVID-19 Cumulative Infection Collaborators:** Estimating global, regional, and national daily and cumulative infections with SARS-CoV-2 through Nov 14, 2021: a statistical analysis. Lancet. 2022
- **COVID-19 Forecasting Team**. Variation in the COVID-19 infection-fatality ratio by age, time, and geography during the pre-vaccine era: a systematic analysis. Lancet. 2022 Apr 16;399(10334):1469-1488. doi: 10.1016/S0140-6736(21)02867-1. Epub 2022 Feb 24. Erratum in: Lancet. 2022 Apr 16;399(10334):1468. PMID: 35219376; PMCID: PMC8871594.
- Yigezu A, Mirkuzie AH, Misganaw A, **Tesfaye L**, Tilahun G, Zergaw A, Hailu A, Abate E, Asnake W. The Indirect Impact of COVID-19 Pandemic on Maternal and Child Mortality in Ethiopia: A Modelling Study, 2020. http://dx.doi.org/10.2139/ssrn.3694748
- Ayele W, **Tesfaye L**, Abagero A, Taye G, Abate B, Habtamu T, et al. COVID-19 Epidemic trajectory modeling results for Ethiopia. Ethiop J Heal Dev. 2021;35: 25–32.
- Endeshaw, F.B., Getnet, F., Temesgen, A.M., Mirkuzie, A.H, **Tesfaye, L**., Kefyalew A., Birhanie, S.K. (2022). Effects of climatic factors on COVID19 transmission in Ethiopia. Scientific Reports, 12(1), 19722. https://doi.org/10.1038/s41598022240249
- Hendrix N, Warkaye S, **Tesfaye L**, Woldekidan MA, Arja A, Sato R, Memirie ST, Mirkuzie AH, Getnet F, Verguet S. Estimated travel time and staffing constraints to accessing the Ethiopian health care system: A two-step floating catchment area analysis. J Glob Health. 2023 Jan 27;13:04008. doi: 10.7189/jogh.13.04008. PMID: 36701563; PMCID: PMC9880518.
- Sato R, Memirie ST, Mirkuzie AH, Zelalem M, Lakew Y, Kiros M, Bolongaita S, Getnet F, **Tesfaye L**, Verguet S. Estimating the financial risks associated with vaccine-preventable diseases in sub-Saharan Africa: the case study of Ethiopia
- Memirie ST, Tolla MT, Rumpler E, Sato R, Bolongaita S, Tefera YL, **Tesfaye L**, Tadesse MZ, Getnet F, Mengistu T, Verguet S. Out-of-pocket expenditures and financial risks associated with treatment of vaccine-preventable diseases in Ethiopia: A cross-sectional costing analysis. PLoS Med. 2023 Mar 10;20(3):e1004198. doi: 10.1371/journal.pmed.1004198. PMID: 36897870; PMCID: PMC10004560.
- **GBD 2019 Meningitis Antimicrobial Resistance Collaborators**. Global, regional, and national burden of meningitis and its aetiologies, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Neurol. 2023 Aug;22(8):685-711. doi: 10.1016/S1474-4422(23)00195-3. PMID: 37479374; PMCID: PMC10356620.

Peer-reviewed publications

- **Tesfaye L**, Forzy T, Getnet F, Misganaw A, Woldekidan MA, Wolde AA, Warkaye S, Gelaw SK, Memirie ST, Berheto TM, Worku A, Sato R, Hendrix N, Tadesse MZ, Tefera YL, Hailu M, Verguet S. Estimating immunization coverage at the district level: A case study of measles and diphtheria-pertussis-tetanus-Hib-HepB vaccines in Ethiopia. PLOS Glob Public Health. 2024 Jul 25;4(7):e0003404. doi: 10.1371/journal.pgph.0003404. PMID: 39052537; PMCID: PMC11271922.
- Getnet F, Forzy T, **Tesfaye L**, Misganaw A, Memirie ST, Geremew S, Berheto TM, Wendrad N, Yihun BY, Mirutse MK, Tsegaye F, Dangisso MH, Verguet S. Inequalities in tuberculosis control in Ethiopia: A district-level distributional modelling analysis. Trop Med Int Health. 2024 Dec 5. doi: 10.1111/tmi.14066. Epub ahead of print. PMID: 39632696.

Manuscripts under development

- Abay S, Zerihun W, Anteneh Y, Aklilu TS, Asnake W, Abraham T, Fentabil G, **Tesfaye L**, Mohammed B, Mulugeta G, Veranyuy D, Perseverence S, Alemnesh HM, Lovemore S, Adey F, Peter S. medRxiv 2023.05.20.23290268; doi: https://doi.org/10.1101/2023.05.20.23290268
- Forzy T, **Tesfaye L**, Getnet F, Misganew A, Warkaye S, Memire ST, Zelalem M, Lakew Y, Verguet S. The broader geographic and socioeconomic determinants of vaccine coverage in Ethiopia: a spatial and multistage analysis at the district level
- **Tesfaye L,** Sabra A, Emily H, Mosser JF. Assessing the data quality and utility of administrative vaccine data as reported to WHO: a case for low- and middle-income countries
- **Tesfaye L**, Sabra A, Emily H, Mosser JF. Addressing data quality gaps of administrative vaccine data as reported to WHO for building administrative vaccine profile for low- and middle-income countries
- **Tesfaye L**, Nishali P, William G, Mosser JF. Evaluating the impact of the Tigray conflict between the year 2020 - 2022 on childhood vaccination rates in Ethiopia: A modelling approach
- **Tesfaye L**, Tom F, Zeb C, Sabra A, Emily H, Mosser JF. Mapping vaccination landscapes with DHIS data fusion: estimating full vaccination coverage and disparities across Ethiopian districts
- **Tesfaye L**, Sabra A, Emily H, Mosser JF. A comparative analysis of small area estimation models for determining vaccination coverage in Ethiopia using the 2019 and 2016 survey
- **Tesfaye L**, Tom F, Zeb C. Beyond Odds Ratios: enhancing clarity with simulated probabilities in under-five survival analysis using Ethiopia's 2019 Demographic Health Survey

Training manuals, guidelines and grants

- Basics of health data science and practical aspects of health data science training materials (Approval ID: 008AAUTAHS/14/22): AAU accredits NDMC's training manual – National Data Management Center for Health (ephi.gov.et)

- Advanced health data management (COVID-19) training materials
- The third strategic, planning and monitoring (SPM-III) of Ethiopian Public Health Institute, from 2020 - 2030: On the key strategic direction of advancing health data analytics
- National Data Management Center (NDMC) for health: Working Guidelines – National Data Management Center for Health (ephi.gov.et)
- Mirkuzie AH, **Tesfaye L**, Zergaw A, Abuhay T, Schoenborn J, Letta A, Abebe M, Tilahun B. DSI NIH grant, with a title 'Building Data Science Capacity in Ethiopia and neighboring countries to advance public health - Not awarded
- **Tesfaye L**, Worku N, Getnet F, Worku A, Karim A. Bill and Melinda Gates Foundation grant, Strengthening modelling capacity in Ethiopian health policies
- National Data Management Center (NDMC) for health, data quality assessment and assurance guideline
- Endeshaw FB, Worku N, **Tesfaye L**, Mirkuzie AH, Simie A. Developing and operationalizing climate informed early warning and response system for Ethiopian health system

Reports and policy briefs

- **Tesfaye L,** Mirkuzie AH, Worku A, and COVID-19 response task force. Modeling the Impact of Non-Pharmaceutical Interventions (NPIs) for Covid-19 – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L,** Mirkuzie AH, Worku A, and COVID-19 response task force. COVID 19 epidemic trajectory and social distancing; modeling results for Ethiopia and Addis Ababa – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L,** Mirkuzie AH, and COVID-19 response task force. Modeling effectiveness of interventions for COIVD-19 in Addis Ababa – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L,** Mirkuzie AH, Worku A, and COVID-19 response task force. A REPORT OF COVID 19 PROJECTION (A Case on Non-pharmaceutical and Vaccine Interventions) – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L**, Mirkuzie AH, Worku B. Tracking progress in reducing/ending childhood malnutrition in Ethiopia: a scenario-based modeling study – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L**, Tsegaye A, Mirkuzie AH, Worku B. Malnutrition: The Long Living Death-Trap of Ethiopian Children – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L**, Mirkuzie AH. Childhood mortality trends against SDG and HSTP II targets and Intervention coverage – National Data Management Center for Health (ephi.gov.et)
- **Tesfaye L**, Mirkuzie AH, Yigezu A. Studying Case Management and Surveillance Data of Covid-19 at National and Sub-national Levels
- **Tesfaye L**, Mirkuzie AH. Modelling the impact of school closure and/or reopening on COVID-19 transmission.
- **Tesfaye L**, Mirkuzie AH, Childhood mortality trends against SDG and HSTP II targets and Intervention coverage – National Data Management Center for Health (ephi.gov.et)

- **Tesfaye L**, Forzy T, Verguet S. Results of MCV1 and Penta 3 vaccination coverage across 1,083 districts of Ethiopia.
- Fantaye Y, Getnet F, Tadesse B, Worku N, **Tesfaye L**. Integrated data approach for identifying Causes of Neo-Natal Death using multiple data sources: a machine learning way
- Worku N, Tadesse B, Fantaye Y, **Tesfaye L**. Identifying determinant risk factors of Under-five mortality in Ethiopia using AI/ML models

Seminar and conference presentations

- Mirkuzie AH, **Tesfaye L**, Bekele B, Kassa GM, Tessema G, Temesgen AM. Ethiopian Public Health Association (EPHA) Conference Systems, 33rd EPHA Annual Conference, Ethiopia, Addis Ababa. Burden and Causes of Maternal Disorders in Sub-Saharan Africa from 1990 to 2019
- Yigezu A, Mirkuzie AH, Temesgen AM, **Tesfaye L**, Tilahun G, Zergaw A, Hailu A, Waktola EA, Asnake W. EPHA Conference Systems, 32nd EPHA Annual Conference, Ethiopia, Addis Ababa. The Indirect Impact of COVID-19 Pandemic on Maternal and Child Mortality in Ethiopia: A Modelling Study
- **Tesfaye L**, Mirkuzie AH, Misganew A, Getnet F, Worku N, Bheser M, Million R, Taju A, Sultan A, Gezahegn A. 1st annual congress of the CSESE, Ethiopia, Addis Ababa. Fostering Disease and Public Health Intelligence through Data Science applications and creation of centralized health data systems
- **Tesfaye L**, Worku N, Sultan A, Mirkuzie AH. Ethiopian Medical Association (EMA) 57th ANNUAL MEDICAL CONFERENCE, Ethiopia, Addis Ababa. Burden of COVID 19 across demographic groups and across regions in Ethiopia: a descriptive analysis
- **Tesfaye L**, Forzy T. Vaccine Economics - Ethiopia: Setting priorities and defining an essential package of vaccines, US, Boston, MA, from August 16 - 18, 2022 at Harvard T.H. Chan School of Public Health (Vaccine coverage estimation in Ethiopia)
- **Workshop on Basics of Decision Science & Cost-effectiveness Analysis (CEA)** in Health prepared by Harvard T.H. Chan School of Public Health, Addis Ababa University and Ministry of Health, Ethiopia, Addis Ababa, from October 15, 2021 - April 23, 2022
- **Data for better health conference August 19 – 20, 2021**, presentations, Ethiopia, Addis Ababa: Transforming health data analytics using cutting edge techniques and how to decrease under-five mortality deaths for SDG goal? The National Data Management Center for health (NDMC) Hosts High Level Conference – National Data Management Center for Health (ephi.gov.et)
- **Ethiopia Health Information Exchange Policy and Standards** review workshop, Ethiopia, Adama.

Mentorship

Advised data science master's students from University of Gondar, Ethiopia

- Teshager H. Towards Predicting the Risk of Cardiovascular Disease Using Machine Learning Approach
- Dereje T. Identify Risk Factors of Childhood Mortality using Machine Learning
- Fitaye M. The link between family planning and child survival
- Zeleke T. Developing a model for predicting HIV/AIDS Status in Ethiopia using machine learning algorithms

Over professional experience

- COVID-19 Task force - modelling for better response and action (Led the modelling team and developed models, which were used for policy making)
- Vaccine economics taskforce - providing data driven evidence for Ministry of Health, Maternal and Child Health Department
- Adaptation of WHO's early warning, alert and response system for effective response of seasonal diseases

Skills

Data analytics

- Data analysis and modeling with R, Python, Stata and SPSS
- Apache Spark for Big Data Analytics
- Machine learning and Artificial Intelligent algorithms with Python
- Microsimulation and Bayesian modelling with R and Python
- POWERBI and Tableau
- Geospatial analysis with ESRI products

Website development

- Full stack web development in HTML, CSS, plain JS, ReactJS, AngularJS, ExpressJS and NodeJS
- Back-end technology: PHP, MYSQL, SQL, Oracle, MongoDB, and LAMP
- Frameworks: Laravel and Django for web development
- Visualization: D3 and Chart

Other utilities and software

- Online repository for version control
- Object Oriented programming: Java, C and C#
- Mobile application development using React Native and Java + XML

Trainings

- Decision science for effective health investments
- Infectious disease modelling
- Mathematical models in the epidemiology & control of infectious diseases
- Optimization and design of intelligent models
- Advanced statistical data analysis (biostatistics)
- Basics of epidemiology and bio-statistics
- Specialization in Artificial Intelligence and Machine Learning
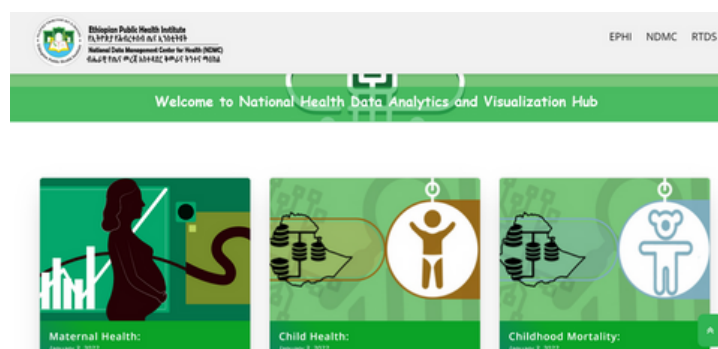
Policy- and data-driven systems

National Data Management Centre for health main page website: Evidence briefs, health blogs and publications (Led the development)

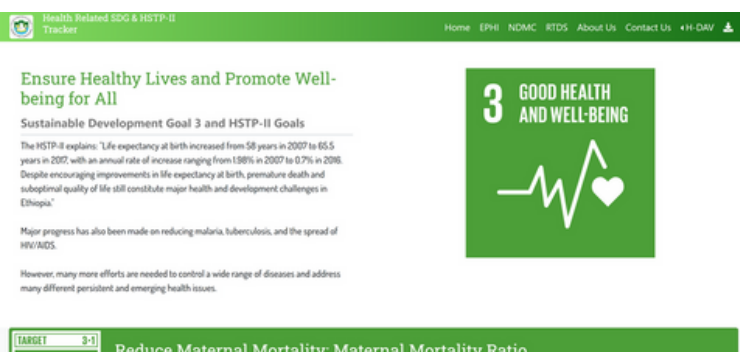National Data Management Center for Health – NDMC (ephi.gov.et)

National Health Data Analytics and Visualization Hub: Maternal and child health indicators (Led the development)

HDAVH | Ethiopian Health Data Analytics and Visualization Hub (ephi.gov.et)

Health related SDG and HSTPII tracker: Key indicators for maternal and child health are tracked (Led the development)

HDAVH | Ethiopian Health Data Analytics and Visualization Hub (ephi.gov.et)
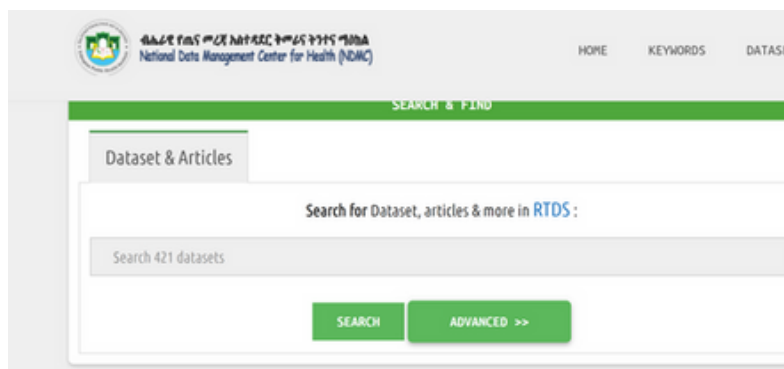
National COVID-19 page tracker: Basic characterizations and forecasting (Led the modelling and development)

HDAVH | Ethiopian Health Data Analytics and Visualization Hub (ephi.gov.et)

RTDS page: National health data and research and tracking database system (Participated in the design)

https://rtds.ephi.gov.et/public/

Engagement with collaborators and partners