Koissi Savi

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Profile

- Strong leadership and collaborative research;
- Experience in multidisciplinary Research
- Rich experience in mathematical modeling and computer simulation
- Five years of experience teaching statistics, mathematics

Education

University of Bonn — Germany, NRW
PhD, Theoretical Ecology (Magna Cum Laude) — *Jul. 2017 – Feb.2022*

University of Abomey-Calavi — Benin, Lit.
M.Sc, Statistics (First-class honor) — *Oct. 2014 – Dec 2016*

University of Abomey-Calavi — Benin, Lit.
M.Sc, Environmental Sci. (First-class honor) — *Oct. 2010 – Dec 2011*

Selected research experience

Postdoc Fellowship — Feb 2021 – Nov. 2022
Dana Farber Cancer Institute/ Harvard School of Medicine — *Department of Medical Oncology*

- Functional genomic on RUNX1
  Access the functional effect of homozygous pathogenic RUNX1 mutations
- Machine learning and deep learning
  Develop a learning pipeline that predicts the functional outcome of unknown variants from a single nucleotide mutations
- Bioinformatics and data analysis
  Assessing the factors that underpin the high prevalence of clonal hematopoiesis in sickle cell patients

Postdoc Fellowship — Feb 2021 – Nov. 2022
T.H. Chan Harvard School of Public Health — *Department of Epidemiology*

- Differential Privacy and metapopulation models
  Access the impact of differential privacy mechanics on epidemiological models using computer simulation; Develop a modular software pipeline
- Assessment of epidemiological metrics in the case of disasters
  Develop the methodology and new metrics that account for mobility data in the case of disaster; computer assessment of the reliability of the metric developed
- Develop modular applications
  Develop a modular software quantifying the impact of noisy data on metapopulation model. Development and Management of a web-deployed dashboard producing actionable reports after a disaster denoted ReadyMapper.

Junior Researcher — Jul. 2017 – Feb. 2022
University of Bonn — *Germany, NRW*

- System modelling and network analysis
  Expert meeting and group modelling of the driving factors underlining the persistence of malaria in urban settings using Accra (Ghana) as a case study.
- Statistical modeling and machine learning
  Investigation of trends and identification of clustering in malaria epidemics in Ghana using the multilevel model and geostatistics methods. Define the context of association using multivariate and machine learning methods.
- Mathematical modelling and computer simulation
  Develop a patch Eulerian model that informs the dynamics of malaria in urban settings. Study of the stability of the mathematical model. Calibrate the mathematical model with real data using partially observed Markov methods. Simulated community behavior and mobility using the mechanistic model developed. Assess the robustness of the developed mechanistic model.
- Mathematical modeling
  Formulation and refinement of maths-prone models with an emphasis on malaria- model-based human mobility.

Most Recent Teaching Experience

Center for Development Research — Jan.; Mar. & Nov. 2021
University of Bonn — *Germany, NRW*

- Complex system and Application
- Introduction to Mathematical epidemiology
- Introduction to Mathematical Biology

Awards, Scholarships, Fellowships and Grants

- "GetFinished" Scholarship, University of Bonn, 2020
- Santa Fe Institute Fellowship, 2019
- System Dynamics Society Student Award, 2018
- Rufford Second Grant, 2017
- Rufford Small Grant, 2015

Certifications

- *Certifications*
- Bioinformatics Core, Harvard Catalyst *(Nov. 2022)*
- Certificate for Human Research, CITI *(Dec. 2022)*
- Data Science, IBM, *(In Progress)*
- Epidemics - the Dynamics of Infectious Diseases, The Pennsylvania State University, *(In Progress)*
- Systems thinking In Public Health, Johns Hopkins University, Apr. 2018

Selected Publications and book chapter

- *Publications related to the Ph.D.*
- **Savi, M.K.** An overview of malaria mechanisms, controls, and modeling (2022). Medical Sciences 11:1
- **Savi, M.K.**, Callo-Concha, D., Tonnang, H.E.Z., Borgemeister, C., (2021). Emerging properties of malaria transmission and persistence in urban Accra, Ghana: evidence from a participatory system approach. Malaria Journal 20:321
- *Selected Published Papers*
- Schmiege, D., Perez Arredondo, A.M., Ntajal, J., Minetto Gellert Paris, J. **Savi, M.K.**, Patel, K., Yasobant, S., Falkenberg, T., (2020). One Health in the context of coronavirus outbreaks- A systematic literature review. One Health Journal
- Madikay, S., **Savi, M.K.**, Gnangnon, B., Hanage, W.P., Okeke, I.N., (2020). Leveraging Africa's pandemic preparedness towards the next phase of the COVID-19 pandemic. Lancet Global Health
- *Submitted*
- **Savi, M.K.**, Pandey, B., Swain A., Lim J., Callo-Concha, D., Mohammed, W., Buckee C.O, Borgemeister, C. A contextual association between malaria and urbanization: Temporal and spatial analysis in Ghana. Journal of Urban Health *(Under review)*
- Perez Arredondo, A.M., Schmiege, D., Ntajal, J., Minetto Gellert Paris, J. **Savi, M.K.**, Patel, K., Yasobant, S. Integrated Science of Global Epidemics. One health for mitigation of future epidemics. Springer *(Under review)*
- *Projects*
- **Savi, M.K.**, Yadav, A., Zhang, W., Vembar, N.,Schroeder, A., Balsari, S., Buckee, C., Vadhan, S., Kishore, N. A standardized differential privacy framework for epidemiological modeling with mobile phone data. Nature Communications. *(Project progress: 90% achieved, To be submitted by Feb., 2023)*
- **Savi, M.K.**, Childs L.M., Borgemeister C. Assessing the impact of insecticide-treated bed nets on urban malaria epidemics in Accra, Ghana using mathematical modeling. Sciences Advances *(Project progress: 90% achieved, To be submitted by Feb, 2023)*
- More from **Savi, M.K.** Google Citation

Policy briefs published

- Ntajal, J., Perez Arredondo, **Savi, M.K.** (2020). Identifying risks and developing sustainable solutions to vector and water-borne diseases in the Greater Accra Metropolitan Area, Ghana. *ZEF policy brief*
- Ntajal, J., Perez Arredondo, **Savi, M.K.** (2020). Urban transformation and health – umbrella framework for Ghana. *ZEF policy brief*

Selected Conferences, Presentations, and Talks

- *Assess the impact of insecticide-treated bed nets on urban malaria epidemics in Accra, Ghana using mathematical modeling*, Georgia Southern University, Biostatistics, Epidemiology and Environmental Health, (GA, USA), Sep. 2022 ;
- *Exploring the complexity of malaria transmission in Ghana*; Harvard T.H. Chan School of Public Health Center for Communicable Disease Dynamics Department of Epidemiology (MA, USA), Dec. 2019
- *From an individual mental model to a malaria system dynamic model: A step toward the elimination of malaria in an urban setting in Accra*; 16th International Conference on Urban Health, ICUH (Xiamen, China), Nov. 2019
- *Host-Vector-Parasite System Dynamics Analysis for Enhancing Malaria Control in Accra, Ghana*; The 36th International Conference of the System Dynamics Society (ReykjavLk, Iceland), Aug. 2018

Technical Skills and Application developed

- **Computer languages** : R, SAS, Python, SQL
- **R plug and play application** DP Metapopulation
- **R package development** REcoToxi, In progress
- **Python and shell-based dashboard** ReadyMapper
- **Language**: *English*: professional proficiency *French*: native *German*: beginner