Asst. Prof. Hüseyin Tunç, BSc, MSc, PhD

Lead, BAU HTA

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Portfolio: Evidence Synthesis and Real-World Evidence

Asst. Prof. Hüseyin Tunç is an applied mathematician, biostatistics and medical informatics academic, and computational health researcher whose work strengthens the quantitative and data-driven foundations of **BAU HTA — Bahçeşehir University Health Technology Assessment Platform**. As **Lead for Evidence Synthesis and Real-World Evidence**, he contributes expertise in mathematical modelling, scientific computing, machine learning, biostatistics, bioinformatics, and health-related data analysis to support evidence-informed and value-oriented decision-making in health technologies.

Dr. Tunç currently serves as **Assistant Professor in the Department of Biostatistics and Medical Informatics** at the Faculty of Medicine of Bahçeşehir University. Before this role, he worked as a project researcher in the Theoretical Biology Laboratory at Bahçeşehir University Faculty of Medicine, contributing to interdisciplinary biomedical modelling and computational research. His academic background combines mathematics, applied mathematics, numerical analysis, and biomedical applications, providing BAU HTA with strong methodological capacity for complex evidence generation and analysis.

He holds a **BSc in Mathematics** from Ege University, an **MSc in Mathematics Engineering** from Yıldız Technical University, and a **PhD in Mathematics** from Yıldız Technical University with a specialization in applied mathematics. His doctoral thesis focused on an implicit-explicit local method for stiff differential equations, while his master's thesis examined finite element techniques for advection-diffusion-reaction processes. This training gives him a strong foundation in quantitative modelling, numerical methods, optimization, and computational approaches relevant to biomedical and health-system problems.

Dr. Tunç's research spans **mathematical biology and modelling, numerical methods for ordinary and partial differential equations, scientific machine learning, deep-learning-aided numerical analysis, scientific computing, optimization, biostatistics, and bioinformatics**. These areas are particularly relevant to BAU HTA's work in evidence synthesis and real-world evidence because modern health technology assessment increasingly requires the ability to work with complex data, model uncertainty, interpret real-world evidence, and integrate quantitative methods into decision-oriented research.

His peer-reviewed publications include work on numerical methods, nonlinear modelling, epidemiological modelling, COVID-19 dynamics, HIV-1 infection modelling, and machine learning applications in biomedical research. Notably, his published research includes studies on predicting HIV-1 protease resistance using genotypic, phenotypic, and molecular information with artificial neural networks; machine-learning-aided multiscale modelling of HIV-1 infection in the presence of antiretroviral therapy; and modelling the early dynamics of the COVID-19 outbreak.

Dr. Tunç has also contributed to conference proceedings on mechanistic modelling of contact tracing and isolation policies, machine learning models in Alzheimer's disease diagnosis, numerical investigation of epidemiological models, and prediction of HIV-1 nucleoside reverse transcriptase resistance with artificial neural networks. This body of work reflects his ability to apply advanced computational and mathematical tools to health-related questions, including infectious diseases, drug resistance, epidemiology, and biomedical decision problems.

His research experience includes competitive national research support. He received a **TÜBİTAK doctoral fellowship** and a **TÜBİTAK postdoctoral project fellowship**. His project roles include serving as a researcher in a TÜBİTAK-BİDEB 2232 project on multiscale modelling of infectious diseases and serving as principal investigator in a TÜBİTAK-BİDEB 2218 postdoctoral project on machine learning techniques for modelling the efficacy of drugs against resistant HIV-1 variants. He has also been involved as a researcher in a TÜBİTAK-ARDEB 1001 project focused on dynamic structure-based pharmacophore models and accelerated virtual screening.

Within BAU HTA, Dr. Tunç's role is strategically important because he brings a rigorous quantitative perspective to the assessment of health technologies, clinical evidence, and real-world data. His expertise supports projects involving **evidence synthesis, real-world evidence generation, statistical and computational modelling, machine learning, biomedical data analysis, uncertainty assessment, and methodologically robust research design**. This strengthens BAU HTA's ability to produce credible, data-driven outputs for academic, public-sector, industry, and regional stakeholders.

Dr. Tunç's contribution is especially valuable in areas where health innovation and decision-making depend on complex evidence, including digital health, AI-enabled health technologies, diagnostics, infectious diseases, biomedical innovation, real-world data, and advanced analytical methods. His methodological background complements BAU HTA's broader expertise in HTA, HEOR, market access, health policy, clinical outcomes, and value-based healthcare.

Through his role at BAU HTA, Dr. Tunç helps advance the platform's mission to connect **academic rigor, applied relevance, and regional impact**. His work supports BAU HTA's

capacity to generate, interpret, and communicate high-quality evidence for better health technology decisions across Türkiye and neighboring regions.