Dr. Benedikt Langenberger

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Summary

PhD-trained health economist and data scientist with 5+ years of experience applying machine learning and causal inference to real-world healthcare data. Proven track record in developing predictive models, evaluating digital health interventions, and leading international collaborations (Germany, US). Strong background in leveraging large-scale hospital and claims data for AI-driven solutions to improve patient outcomes and drug safety. Seeking to bring expertise in AI, data, and healthcare to the scientific community.

Education

Stanford University — Stanford, California, United States of America
Visiting Student Researcher (PhD) — *11/2023 – 04/2024*

Technical University of Berlin — Berlin, Germany
Doctoral Degree in Economics (summa cum laude) — *10/2020 – 05/2024*

University of Hamburg — Hamburg, Germany
Master of Science, Health Economics and Health Care Management (GPA 3.79) — *10/2017 – 09/2019*

Wiesbaden Business School — Wiesbaden, Germany
Bachelor of Science, Health Care Economics (GPA 3.55) — *10/2014 – 09/2017*

Professional Experience

Hasso Plattner Institute — Potsdam, Germany
Postdoctoral Researcher — *October 2024 – current*

– Conducting research in international teams with a focus on machine learning and causal inference in various healthcare applications
– Developing and submitting competitive research grant applications
– Lecturer in Health Care Economics (Master's program)
– Supervising undergraduate and graduate theses in data science and health economics

Icahn School of Medicine at Mount Sinai — New York City, United States of America
Volunteer Research Collaborator — *November 2024 – present*

– Collaborating with the Windreich Department of Artificial Intelligence and Human Health
– Project: *Prediction of Hepatic Encephalopathy* using machine learning on hospital data
– Project: *Causal Effect of Length of Stay on Health Outcomes*, a quasi-experimental study using observational data

Technical University of Berlin — Berlin, Germany
Research Associate — *October 2020 – September 2024*

– Designed and implemented predictive models and causal analyses on large-scale hospital and claims data
– Led and evaluated government-funded research projects on digital health interventions and hospital outcomes
– Supervised undergraduate and graduate students in econometrics, statistics, and health economics

KPMG AG — Hamburg, Germany
Associate, Healthcare — *October 2019 – September 2020*

– Advised hospitals on healthcare strategy and financial performance improvement
– Contributed to a large-scale hospital revenue cycle transformation project in the Middle East, focusing on process optimization and compliance

Honors & Awards

Doctoral Degree in Economics, Graduated with distinction (summa cum laude) *2024*

DAAD Doctoral Scholarship, Scholarship for a 6-month stay at Stanford University ($24,500) *2023-2024*

Nominee Fulbright Doctoral Scholarship, Nominated as Fulbright Scholar *2023*

Best Graduate of Class, University of Hamburg, Masters program *2019*

Best Graduate of the Year, Wiesbaden Business School, Bachelors program *2017*

External Grants

DIGI-POD, Co-Investigator (PI: Reinhard Busse) *€1,500,000*

OAV, Lead Health Economic Evaluation (PI: Reinhard Busse) *€6,600,000*

PROMoting Quality, Co-Investigator, (PI: Reinhard Busse) *€3,500,000*

Skills

Languages	German (native), English (fluent)
Programming	R, LaTeX, SQL, Java
Tools and Frameworks	Jupyter Notebook, RStudio, Android Studio, SAP S/4HANA

Certifications

Data or Specimens Only Research, CITI *2021*

Getting to Grips with the Tidyverse, Jumping Rivers Ltd *2021*

Introduction to Data Science in Python, DataCamp, certificate-ID: 13235499 *2020*

Recurrent Neural Networks for Language Modeling in Python, DataCamp, certificate-ID: 12649014 *2020*

Publications

Langenberger, B., Schrednitzki, D., Halder, A., Busse, R., & Pross, C. (2025). Leveraging machine learning for duration of surgery prediction in knee and hip arthroplasty–a development and validation study. *BMC Medical Informatics and Decision Making*, *25*(1), 106.

Langenberger, B., Siegel, M., Busse, R., & Vogt, V. (2025). Health economic evaluation of a medication safety intervention in elderly care: Identifying causal effects in a multi-center quasi-experimental study design. *BMC Health Services Research*, *25*(1), 773.

Tsatsaronis, C., Klemt, M., Kinder, K., Langenberger, B., Braun, A., Grobe, T. G., Busse, R., & Quentin, W. (2025). Definition zusammengefasster krankheitsgruppen für ein klassifikationssystem zur messung des morbiditätsbezogenen versorgungsbedarfs–popgroup. *Das Gesundheitswesen*, *87*(04), 282–290.

Langenberger, B., Steinbeck, V., & Busse, R. (2024). Who benefits from hip arthroplasty or knee arthroplasty? preoperative patient-reported outcome thresholds predict meaningful improvement. *Clinical Orthopaedics and Related Research®*, *482*(5), 867–881.

Schöner, L., Kuklinski, D., Wittich, L., Steinbeck, V., Langenberger, B., Breitkreuz, T., Compes, F., Kretzler, M., Marschall, U., Klauser, W., et al. (2024). Cost-effectiveness of a patient-reported outcome-based remote monitoring and alert intervention for early detection of critical recovery after joint replacement: A randomised controlled trial. *Plos Medicine*, *21*(10), e1004459.

Steinbeck, V., Bischof, A. Y., Schöner, L., Langenberger, B., Kuklinski, D., Geissler, A., Pross, C., & Busse, R. (2024). Gender health gap pre-and post-joint arthroplasty: Identifying affected patient-reported health domains. *International Journal for Equity in Health*, *23*(1), 44.

Kollmann, N. P., Langenberger, B., Busse, R., & Pross, C. (2023). Stability of hospital quality indicators over time: A multi-year observational study of german hospital data. *Plos one*, *18*(11), e0293723.

Langenberger, B. (2023a). Machine learning as a tool to identify inpatients who are not at risk of adverse drug events in a large dataset of a tertiary care hospital in the usa. *British Journal of Clinical Pharmacology*, *89*(12), 3523–3538.

Langenberger, B. (2023b). Who will stay a little longer? predicting length of stay in hip and knee arthroplasty patients using machine learning. *Intelligence-Based Medicine*, *8*, 100111.

Langenberger, B., Schrednitzki, D., Halder, A. M., Busse, R., & Pross, C. M. (2023). Predicting whether patients will achieve minimal clinically important differences following hip or knee arthroplasty: A performance comparison of machine learning, logistic regression, and pre-surgery prom scores using data from nine german hospitals. *Bone & Joint Research*, *12*(9), 512–521.

Langenberger, B., Schulte, T., & Groene, O. (2023). The application of machine learning to predict high-cost patients: A performance-comparison of different models using healthcare claims data. *PloS one*, *18*(1), e0279540.

Langenberger, B., Steinbeck, V., Schöner, L., Busse, R., Pross, C., & Kuklinski, D. (2023). Exploring treatment effect heterogeneity of a proms alert intervention in knee and hip arthroplasty patients: A causal forest application. *Computers in Biology and Medicine*, *163*, 107118.

Steinbeck, V., Langenberger, B., Schöner, L., Wittich, L., Klauser, W., Mayer, M., Kuklinski, D., Vogel, J., Geissler, A., Pross, C., et al. (2023). Electronic patient-reported outcome monitoring to improve quality of life after joint replacement: Secondary analysis of a randomized clinical trial. *JAMA Network Open*, *6*(9), e2331301–e2331301.

Langenberger, B., Baier, N., Hanke, F.-C., Fahrentholz, J., Gorny, C., Sehlen, S., Reber, K. C., Liersch, S., Radomski, R., Haftenberger, J., et al. (2022). The detection and prevention of adverse drug events in nursing home and home care patients: Study protocol of a quasi-experimental study. *Nursing Open*, *9*(2), 1477–1485.