

# **Executive Training Programme on Data Science and Evidence-Based Policy-Making**

## **Module 2: Data Science for Policy-Making**

27 May – 1 June 2024

Location:  
Radisson Blu Iveria Hotel  
1 Rose Revolution Square, T'bilisi 0108  
Meeting Room 3

**Hertie School Executive Education  
Deutsche Gesellschaft für Internationale Zusammenarbeit  
(GIZ)**

**DAY 1: Fundamental Data and Statistical Literacy**
**Monday, 27 May 2024**

12:15 – 12:30	<b>Arrival and Coffee</b> ( <i>Meeting Room 3, Radisson Blu Iveria Hotel</i> )
12:30 – 12:45	<b>Welcome Remarks</b> <i>Eva Savinova, Head of Operations and Programmes, Executive Education, Hertie School</i> <i>Katharina Neumann, Project Coordinator, Executive Education, Hertie School</i>
12:45 – 14:15	<b>Session I: Data science, Statistical Reasoning, and Policy-Making</b> <i>Prof. Dr. Simon Munzert</i>  In this introductory session, we will approach data science and the data science pipeline. We will discuss what (data) science can contribute to public policy, and why it is key to foster good practices and to be able to call out flawed data-based reasoning. Finally, we consider the overall learning goals for this workshop.
14:15 – 14:45	<i>Lunch</i>
14:45 – 16:15	<b>Session II: Consuming Statistics</b> <i>Prof. Dr. Simon Munzert</i>  In this session, we will discuss the bread and butter of descriptive and inferential statistics. The goal is to be able to make sense of (a) descriptive statistics, (b) statistical effects and significance, and (c) probability and uncertainty measures.
16:15 – 16:30	<i>Coffee Break</i>
16:30 – 18:00	<b>Session III: Spotting Flawed Statistical Reasoning</b> <i>Prof. Dr. Simon Munzert</i>  In this session, we will turn to three classic sins of statistical reasoning: (1) bad sampling and misconceptions of representativity, (2) bad analytics and misleading obsession with statistical significance, and (3) bad inference and confusing correlation with causation. We will discuss how to spot those flaws in the wild and how to address them.

**DAY 2: Policy Evaluation and Impact Assessment using Data Science**
**Tuesday, 28 May 2024**

09:45 – 10:00	<b>Arrival</b>
10:00 – 11:30	<b>Session I: Causal Reasoning for Policy Evaluation</b> <i>Prof. Dr. Simon Munzert</i>  To set the foundation for our thinking about policy evaluation, we will center on the concept of counterfactual thinking. We will discuss why it matters for effective policy analysis and approach the fundamental problem of causal inference. We start discussing experimental and observational designs to tackle causality.
11:30 – 11:45	<i>Coffee Break</i>
11:45 – 13:15	<b>Session II: Regression and DAGs</b> <i>Prof. Dr. Simon Munzert</i>  We will learn to use the graph framework to specify their assumptions about causal relationships between policy interventions and their outcomes, essential for accurately assessing the soundness of causal reasoning around policy effectiveness. We then discuss how to use regression for causal inference and how DAGs (directed acyclic graphs) can support effective confounder adjustment in the regression context.
13:15 – 14:15	<i>Lunch Break</i>
14:15 – 15:45	<b>Session III: Quasi-Experiments</b> <i>Prof. Dr. Simon Munzert</i>  In this session, we explore the use of quasi-experiments for policy analysis. Participants will learn about the opportunities to evaluate policies in real-world settings where randomized controlled trials may not be feasible. Tools to analyze observational data for causal inference that we discuss include policy impact evaluation with observational data; interrupted time-series; RDD; difference-in-differences
15:45 – 16:00	<i>Coffee Break</i>
16:00 – 17:30	<b>Session IV: Spotting Crimes against Causality</b> <i>Prof. Dr. Simon Munzert</i>  This session rounds up our discussion of causal thinking for policy evaluation. We revisit some of the most notorious threats to internal and external validity by example and explore them interactively case by case.

**DAY 3: Artificial Intelligence for Policy-Making**
**Wednesday, 29 May 2024**

09:45 – 10:00	<b>Arrival</b>
10:00 – 11:30	<b>Session I: The Promise and Perils of Big Data</b> <i>Prof. Dr. Simon Munzert</i>  We start the day with getting an overview of AI technologies and their basis – large corpora of (un-)structured data. We discuss the big data paradox and what it means for assessing big-data-based evidence for policy. Furthermore, we briefly look into the potential of AI for governance.
11:30 – 11:45	<i>Coffee Break</i>
11:45 – 13:15	<b>Session II: Machine Learning 101</b> <i>Prof. Dr. Simon Munzert</i>  This session provides a primer to machine learning (ML). We study the logic of prediction and predictive modeling and get an overview of the vast array of ML models. Finally, we learn the basics of consuming ML research and of assessing performance and external validity of ML-based designs.
13:15 – 14:15	<i>Lunch Break</i>
14:15 – 15:45	<b>Session III: Simulation: Solving Policy Challenges with Evidence (Part I)</b> <i>Prof. Dr. Simon Munzert</i>  In this interactive session, participants are confronted with a policy challenge. In teams, they have to evaluate and present evidence on the impact of several policy options, applying the skills and tools they have learned in the previous sessions. Based on this, they develop an evaluation design to optimize findings on the desired and undesired effects of the policy and incorporate them into decisions in the policy-making process.
15:45 – 16:00	<i>Coffee Break</i>
16:00 – 17:30	<b>Session IV: Simulation: Solving Policy Challenges with Evidence (Part II)</b> <i>Prof. Dr. Simon Munzert</i>  This session continues and concludes the previous session.

**DAY 4: Informed Consumption of Evidence**
**Thursday, 30 May 2024**

09:45 – 10:00	<b>Arrival</b>
10:00 – 11:30	<b>Session I: What is Evidence? And how can it Inform Policy?</b> <i>Sebastian Ramirez Ruiz</i>  In this session, we discuss the nature and types of evidence, including anecdotal, qualitative, and quantitative insights. Participants will learn think about indicators of progress and measures of effectiveness in monitoring and evaluation (M&E). We will also cover the models under which research insights feed into policy recommendations.
11:30 – 11:45	<i>Coffee Break</i>
11:45 – 13:15	<b>Session II: Evidence Synthesis and Meta-Analysis</b> <i>Sebastian Ramirez Ruiz</i>  This session introduces participants to narrative reviews, systematic reviews, and meta-analysis. We will explore how to combine evidence from multiple studies and interpret findings from meta-analytic studies, enhancing the ability to draw robust conclusions from existing research.
13:15 – 14:15	<i>Lunch Break</i>
14:15 – 15:45	<b>Session III: Navigating the World of Evidence: A Practical Workshop for Effective Research</b> <i>Sebastian Ramirez Ruiz</i>  This hands-on workshop focuses on compiling and sorting academic and policy evidence. Participants will learn effective search strategies, methods for evaluating sources, and the use of AI tools for literature mapping, aiming to improve their research efficiency and accuracy.
15:45 – 16:00	<i>Coffee Break</i>
16:00 – 17:30	<b>Session IV: How to Read an Academic Study?</b> <i>Sebastian Ramirez Ruiz</i>  In this session, we guide participants through the process of reading and understanding academic articles. Key skills include identifying the main arguments, evaluating the methodology, and assessing the significance and relevance of the findings for policy and practice.

**DAY 5: Data Visualization and Communication**
**Friday, 31 May 2024**

09:45 – 10:00	<b>Arrival</b>
10:00 – 11:30	<b>Session I: Principles of Data Visualization</b> <i>Sebastian Ramirez Ruiz</i>  In this session, we delve into the importance of effective data visualization and its role as a method for conveying information. Participants will learn about the essential ingredients of impactful visualizations and how these can be applied to policy analysis and communication.
11:30 – 11:45	<i>Coffee Break</i>
11:45 – 13:15	<b>Session II: Data Visualization Tools and Techniques</b> <i>Sebastian Ramirez Ruiz</i>  This session introduces design principles for creating clear and effective graphs. We will cover how to choose the appropriate type of visualization for your data, best practices for labeling, coloring, and annotating visualizations, and explore popular data visualization tools such as ggplot2.
13:15 – 14:15	<i>Lunch Break</i>
14:15 – 15:45	<b>Session III: Communicating and Reporting Strategies I</b> <i>Sebastian Ramirez Ruiz</i>  In this session, we focus on the various strategies for communicating data science. Topics include statistical communication, written communication, and interactive communication through dashboards, all aimed at effectively conveying complex data insights.
15:45 – 16:00	<i>Coffee Break</i>
16:00 – 17:30	<b>Session IV: Communicating and Reporting Strategies II</b> <i>Sebastian Ramirez Ruiz</i>  Building on the previous session, this session covers reporting requirements and formats for different audiences. We will discuss how to present data to facilitate individual and institutional learning, ensure accessibility, and support the use of insights through clear recommendations and support mechanisms.

**DAY 6: Data Management and Ethics**
**Saturday, 1 June 2024**

09:45 – 10:00	<b>Arrival</b>
10:00 – 11:30	<b>Session I: Data Collection and Storage</b> <i>Sebastian Ramirez Ruiz</i>  This session focuses on planning effective data collection methods and developing comprehensive data management plans (DMP). Participants will learn strategies to ensure data integrity and security throughout the data lifecycle.
11:30 – 11:45	<i>Coffee Break</i>
11:45 – 13:15	<b>Session II: Guiding Principles for Data Management</b> <i>Sebastian Ramirez Ruiz</i>  In this session, we explore the FAIR principles (Findability, Accessibility, Interoperability, and Reuse) for data management. Topics include open data, archiving and publishing practices, compliance with data protection regulations, and techniques for discovering and accessing data.
13:15 – 14:15	<i>Lunch Break</i>
14:15 – 15:45	<b>Session III: Ethical Considerations in Data Science</b> <i>Sebastian Ramirez Ruiz</i>  This session covers the core principles of data ethics and how they apply to everyday practices in data science. Participants will discuss research ethics, fairness in data science, and practical approaches to ensuring ethical standards are maintained in their work.
15:45 – 16:00	<i>Coffee Break</i>
16:00 – 17:00	<b>Discussion</b> <i>Sebastian Ramirez Ruiz</i>
17:00 – 17:30	<b>Evaluation and Closing</b>

## Speaker Biographies

**Prof. Dr. Simon Munzert** | Professor of Data Science and Public Policy | Hertie School



**Simon** is Professor of Data Science and Public Policy at the Hertie School. He is the Director of the Hertie School Data Science Lab. His research interests include opinion formation in the digital age, public opinion, and the use of experimental and online data in social research and for impact evaluation. He is author of a textbook on automated web data collection and is teaching data science and statistics in the Master of Data Science for Public Policy program at the Hertie School. He received his Doctoral Degree in Political Science from the University of Konstanz.

**Sebastian Ramirez Ruiz** | Doctoral Candidate and Research Associate | Hertie School



**Sebastian** is a doctoral candidate and a Research Associate at the Hertie School in Berlin. His research interests lie at the intersection of causal inference, policy monitoring and evaluation, and the use of research evidence in decision-making. He holds a Master of Public Policy and B.A. in Sociology and Political Science. Sebastian has a professional background in diplomatic advising and a consultancy for emergency relief and development projects.



## Hertie School Executive Education Team

**Katharina Neumann** | Project Coordinator, Executive Education | Hertie School



**Katharina** is Project Coordinator for Executive Education and responsible for customised programmes for international executives. She studied International Economics and Development (B.A.) at the University of Bayreuth and at the Tel Aviv University as well as International Economics (M.Sc.) at the University of Göttingen. Before joining the Hertie School, Katharina gained experience in international development cooperation as a consultant at the Food and Agriculture Organisation of the United Nations and in development economics research at the University of Göttingen, among others.

**Mai Kishimoto Hohwy** | Project Coordinator, Executive Education | Hertie School



**Mai** holds a Bachelor and Master of Science in Political Science from Aarhus University, Denmark. Prior to joining the Executive Education team as a Project Coordinator, she gained experience at the Danish Embassy in Berlin, where she helped organise and execute HRH the Queen of Denmark's state visit to Germany. She has also worked at the Danish Embassy in Tokyo as a political intern and in the Danish recruitment consultancy, MUUSMANN A/S. She speaks English, German and Danish fluently and has knowledge of Japanese, Swedish and Spanish.

**Eva Savinova** | Head of Operations and Programmes, Executive Education | Hertie School



**Eva** is Head of Operations and Programmes for Executive Education, where she oversees strategic partnerships, programme and portfolio development, and implementation of high-profile international executive programmes. She leads the Executive Education department team, which develops and delivers executive capacity-building programmes in the area of public policy for international clients around the world. Eva gained extensive experience as project manager at international companies based in Switzerland and also conducted research at the United Nations Headquarters in New York within the Department of Economic and Social Affairs (UN DESA). Before joining the Executive Education department, Eva worked on a comprehensive research project at the Hertie School, focusing on economic policy advice in Germany and the USA. In addition to her Diploma degree in Sociology, Eva holds a Master's degree in European Studies and Politics from the University of Konstanz (Germany) and the University of California, Berkeley (USA). She also holds an advanced executive certificate in Leadership and Management from Harvard Business School.