

## CV – AXEL BUDDE

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### PERSONAL DATA

Axel Budde

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### PROFILE

Psychologist (M.Sc. Hons, UvA) with seven years of clinical research experience across oncology, palliative care, and public health. Specialising in patient-centered outcomes, psychometric validation, and clinical data science. PhD candidate (University of Bonn, Faculty of Medicine): machine-learning prediction of quality of life after childhood cancer.

### PHD RESEARCH

**2019 – 2027: Rheinische Friedrich-Wilhelms-Universität Bonn, Germany**

Faculty of Medicine “*Use of machine learning to predict quality of life after childhood cancer*”

Supervisor: Prof. Dr. Matthias Schmid

### SELECTED PUBLICATIONS

**Budde A** et al.

*Using cancer registry data to predict non-response in childhood cancer survivor surveys: logistic regression versus machine learning.*

Manuscript in preparation (2026).

- Non-response prediction in two independent population-based cohorts of childhood cancer survivors (VIVE:  $n = 10,125$ ; E-SURV:  $n = 2,292$ )
- Benchmarked logistic regression against five ML classifiers within a stratified cross-validation framework; findings directly inform PRO data quality and non-response adjustment in survivor studies

**Budde A**, Baust K, Weinhold L, et al.

*Linking EORTC QLQ-C30 and PedsQL/PEDQOL physical functioning scores in patients with osteosarcoma.*

**European Journal of Cancer** (2022). doi:10.1016/j.ejca.2022.03.018

- Cross-instrument harmonisation of paediatric (PedsQL, PEDQOL) and adult (EORTC QLQ-C30) COAs via single-group equipercentile linking; EURAMOS-1 QoL sub-study (osteosarcoma patients, 3 continents)
- Established a common metric for longitudinal QoL analysis across the full patient lifespan; Lin’s  $\rho = 0.74 / 0.64$  against EORTC QLQ-C30
- Preliminary findings presented as poster, North American Symposium on Late Complications After Childhood Cancer, Atlanta (2019)

*Full publication list available on request.*

SELECTED  
PROJECTS

**FUN For Fit – Psychometric Analysis Tool (R Shiny, 2025)**

Evaluating the practical significance of item misfit in psychological and educational tests ([axelbuddle.shinyapps.io/FUNForFit](https://axelbuddle.shinyapps.io/FUNForFit))

- Rasch model (1PL) and 2PL IRT analysis of weighted MNSQ fit statistics (TAM package) – methods central to Clinical Outcome Assessment (COA) validation
- 2D IRT modelling to estimate correlation bounds after [Köhler & Hartig \(2017\)](#)
- Step-guided interface enabling non-technical researchers to conduct psychometric instrument evaluation; interactive result visualisation (Plotly)

**SHS World Map – Interactive Dashboard (R Shiny, 2023–2025)**

Global visualisation of Serious Health-Related Suffering (SHS) burden data ([shsburden.net](https://shsburden.net)) – developed for the *Lancet Commission on Palliative Care and Pain Relief*

- Patient-centered, epidemiological endpoint: SHS operationalises unmet need for palliative care across 195 countries
- Interactive maps, time series charts, and hierarchical visualisations of health-burden indicators used in regulatory and policy contexts
- Responsive web dashboard with complex filtering for research and advocacy audiences

**Routing Ruler – SaaS Rule Compliance Application (R Shiny, 2024–2025)**

([routingruler.com](https://routingruler.com)) – Commercial freemium tool for airline fare routing rule analysis

- Commercial freemium SaaS product; end-to-end ownership from algorithm design through cloud deployment and subscription management
- Parses heterogeneous routing rule sets from multiple industry data sources (ExpertFlyer, KVS Tool, Amadeus GDS) and generates all compliant itinerary combinations via multi-dimensional constraint logic
- User-centred interface designed for non-technical users navigating expert-domain rule systems

PROFESSIONAL  
EXPERIENCE

**October 2024 – present: Independent Research & Development**

(concurrent with parental leave)

Primarily development of Routing Ruler ([routingruler.com](https://routingruler.com))

**October 2023 – September 2024: External Lecturer**

Charlotte Fresenius University of Psychology, Düsseldorf, Germany

Lectures in Psychology degree programme (B.Sc.):

Introduction to psychology, research methods, and psychotherapy

**June 2018 – September 2023: Bonn University Hospital**

*February 2023 – September 2023: Research Associate*

Clinic for Palliative Medicine

- Led development of *R Shiny app* for visualisation of *Serious Health-Related Suffering (SHS)*, a patient-centered outcome measure adopted by the *Lancet Commission on Palliative Care and Pain Relief*
- Contributed to cross-functional teams spanning clinical medicine, epidemiology, and health policy

*October 2020 – December 2022: Head of Local Staff Unit*

Network University Medicine (NUM), Institute for Virology

Coordination of Local Staff Unit within the national COVID-19 research network; cross-institutional collaboration across university hospitals

*June 2018 – September 2020: Research Associate*

Centre for Paediatrics, Department of Paediatric Haematology/Oncology

Coordination of project „E-Surv“ (Funding: German Cancer Aid):

- Randomised study ( $n = 2,000$ , German Childhood Cancer Registry) comparing paper-based and eCOA administration of validated PRO instruments including EORTC-QLQ-C30, SF-36, and Multidimensional Fatigue Inventory – a direct eCOA mode equivalence study
- Logistic regression modelling of response rate predictors (sex, socioeconomic deprivation, time since diagnosis)
- Metadata harmonisation across multiple paediatric oncology studies (COSS, CESS, CWS) using Samplify.MDR metadata repository

Graduate programme „Epidemiological Research Using Cancer Registry Data“ (German Cancer Aid):

- *July – August 2019*: University of Mainz, German Childhood Cancer Registry – Comparative non-response analysis of patient surveys
- *January – February 2019*: University of Bern, Switzerland, Institute of Social and Preventive Medicine (ISPM), Paediatric Cancer Epidemiology Group (Prof. Dr. Claudia Kühni) – Development of Shiny app for space-time analyses of Swiss Childhood Cancer Registry data

**January 2017 – May 2018: Further training R/Shiny developer / Self-employment**

**March 2013 – December 2016: Scientific Officer**

Federal Institute of Public Health (BIÖG), formerly BZgA  
Department of Prevention of Substance Abuse, Addiction Prevention  
Cologne, Germany

- Coordination of federal-state network for online documentation system Dot.sys
- Coordination of EU project “Reducing Alcohol Related Harm” (RARHA) (Work Package Co-Lead)
- Representation within German Monitoring Centre for Drugs and Drug Addiction (DBDD) and vis-à-vis European Monitoring Centre on Drugs and Drug Addiction (EMCDDA)

**March 2011 – February 2013: Self-employment**

Boutique air travel agency Airotique

**August 2007 – February 2011: Research Associate and Coordinator**

EU Project “Children Affected by Parental Alcohol Problems” (ChaPAPs)  
Catholic University of Applied Sciences North Rhine-Westphalia (KatHO NRW)  
/ German Institute for Addiction and Prevention Research (DISuP), Cologne

**November 2005 – July 2007: Regional Sales Engineer**

Noldus Information Technology  
Berlin, Germany (11/06 – 07/07) / Wageningen, Netherlands (11/05 – 10/06)

UNIVERSITY  
STUDIES

**Universiteit van Amsterdam (UvA), Amsterdam, Netherlands**

Psychology (1998 – 2004)

M.Sc. (With Honours), 2004

*Specialisations: Clinical Psychology, Research Methods & Psychometrics*

**University of the Saarland, Saarbrücken, Germany**

Law (1997 – 1998)

**Université de Pau et des Pays de l'Adour, Pau, France**

Sciences Criminelles (1996 – 1997)

Diplôme de Sciences Criminelles, 1997

**University of Greifswald, Greifswald, Germany**

Law (1994 – 1996)

SCHOLARSHIPS

**Bonn University Foundation / Kind-Philipp Foundation for Paediatric Oncology Research**

Travel scholarships for poster presentation of preliminary findings from “*Linking EORTC QLQ-C30 and PedsQL/PEDQOL physical functioning scores in patients with osteosarcoma*”

North American Symposium on Late Complications After Childhood Cancer, Atlanta, Georgia, USA (2019)

**German Academic Exchange Service (DAAD)**

Short scholarship for internship – United Nations Office on Drugs and Crime (UN-ODC), Regional Centre for East Asia and the Pacific, Bangkok, Thailand (2004)

**Universiteit van Amsterdam (UvA) / Faculty of Psychology**  
STUNT & supplementary scholarships – study visit, Xiamen University, People’s  
Republic of China (2003)

SCHOOL  
EDUCATION

**Dietrich-Bonhoeffer-Gymnasium**, Weinheim/Bergstraße, Germany  
A-levels (Abitur), 1994

**Brantford Collegiate Institute**, Brantford, Ontario, Canada  
1990 – 1991

SPECIALISATION

**Johns Hopkins University on Coursera**  
Mastering Software Development in R (5-course specialisation, 2017)  
Including: Advanced R Programming, Building Data Visualization Tools, Building  
R Packages

TECHNICAL  
SKILLS

**Programming**

R (daily since 2017 – expert), R Shiny (daily – expert),  
SQL (often), L<sup>A</sup>T<sub>E</sub>X (often), R Markdown (often)

**Outcomes Research & Psychometrics**

Clinical Outcome Assessment (COA) instrument analysis,  
Item Response Theory (IRT): Rasch / 2PL models (TAM package),  
Patient-Reported Outcome (PRO) / eCOA methodology,  
Survey mode effects, non-response analysis,  
Psychometric validation (fit statistics, reliability, validity)

**Statistics & Data Science**

Time series analysis, hypothesis testing, KPI development,  
data cleaning, reproducible workflows,  
machine learning (random forests, penalised regression – PhD context)

**Documentation & Reporting**

Jupyter notebooks (proficient), R Markdown (expert),  
L<sup>A</sup>T<sub>E</sub>X (often), Git/GitHub (proficient)

**Cloud & Deployment**

Render (daily), Supabase (often), AWS (often)

**Additional Tools**

Metadata database MDR.Samply (often), SaTScan (often), QGIS (rarely),  
MySQL (often)

LANGUAGES

**English** Business fluent, IELTS (Academic) Band 8.5/9

**Dutch** Business fluent

**French** Fluent

**Spanish** Advanced basics

**German** Native