

Annual Report 2022

Institute of Social and Preventive Medicine ISPM





Content

5	Director's Letter	38	Environmental and Spatial Epidemiology
6	Organizational Chart	40	Evidence Synthesis Methods
8	ISPM Facts and Figures	42	HIV, Hepatitis and Tuberculosis
10	Reports from the Research Groups	48	INPUT – Interfaculty Platform for Data and Computational Science
12	Cancer	52	Lifestyle and Behaviour
14	Cardiometabolic Research	56	Mental Health
16	Child and Adolescent Health	58	Musculoskeletal Health and Rheumatology
16	Pediatric Respiratory Epidemiology	60	Palliative Care and End of Life
21	Paediatric Cancer	64	Public Health and Primary Care Library
28	Paediatric and Rare Diseases Registries	66	Sexual and Reproductive Health
32	Climate Change and Health	72	SwissRDL – Medical Registries and Data Linkage
34	Community Health and Health Care Systems		

Director's Letter



In 2022, the COVID-19 pandemic continued affecting our lives and many activities. Yet, even though the Omicron wave began in November 2021 and remained in full swing in the first months of 2022, most (academic) activities returned to “normal” during the second half of 2022.

2022 also started a 2-year transition phase for the Institute of Social and Preventive Medicine (ISPM). After ISPM's 50th anniversary festivities in 2021, the medical faculty organized a process – expected to last until the first half of 2024 – to appoint new professors, possibly including ISPM's new director.

2022 saw many exciting new developments at ISPM, such as

- Professor Annika Frahsa and Professor Sofia Zambrano and their research groups fully operational with expanded activities
- Professor David Schwappach starting mid-year with research and teaching activities focused on – mostly structural – aspects of patient safety
- Professor Matthias Egger with his team prepared the 2023 start of the new interfaculty PhD course program in Public Health Sciences and brought several faculties of the University of Bern on board.

I hope you enjoy reading ISPM's 2022 Annual Report. It certainly illustrates the substantial diversity of various activities of Institute staff in research, teaching, and outreach.

I end by thanking all ISPM staff members for their work (of course!) and contributions to our multicultural, multi-interdisciplinary work environment – it regularly allows for surprising new insights and ways to move forward in our respective projects and teaching activities.

Marcel Zwahlen, Director

**Organigram
Institute of Social and Preventive Medicine
(ISPM)**

Directorate
 Marcel Zwahlen, Director a.i.
 Claudia Kuehni, Deputy Director a.i.
 Christian Althaus
 Annika Frahsa
 Brigitte Wanner

Administration and Services
 Personal Assistant to Director
 Finances
 Human Resources
 IT
 Information and Library
 Communication
 Teaching and Course Coordination

Research Board

- Research Groups**
- **Cancer**
Eliane Rohner
 - **Cardiometabolic**
Taulant Muka
 - **Child & Adolescent Health**
Claudia Kuehni
 - **Climate Change & Health**
Ana Vicedo-Cabrera
 - **Community Health**
Annika Frahsa
 - **Environmental & Spatial Epidemiology**
Ben Spycher
 - **Evidence Synthesis Methods**
Georgia Salanti
 - **Health Services**
Marcel Zwahlen
 - **HIV, Hepatitis & Tuberculosis**
Matthias Egger
 - **INPUT - Interfaculty Platform for Data & Computational Science**
Christian Althaus
 - **Lifestyle and Behavior**
Marija Glisic
 - **Mental Health**
Andreas Haas
 - **Musculoskeletal Health & Rheumatology**
Stephan Reichenbach
 - **Palliative Care & End of Life**
Sofia Zambrano
 - **Sexual & Reproductive Health**
Nicola Low
 - **SwissRDL**
Adrian Spörri, Mario Morger

Institute Assembly
 all staff

Version 2022-10-17

ISPM Facts and Figures

as of 31.12.2022

Our research profile covers a wide area of health-related topics across 16 research groups.

We actively participate in university teaching for students of medicine, pharmacy, biomedical engineering, and biomedicine, and we are engaged in courses for PhD students and participants in postgraduate training programs, such as advanced studies (CAS and MAS) as described on ISPM's website.

People



Prof. Dr. Marcel Zwahlen Director a. i.	
Staff members total	160
Research	140
PhD students	40
Admin, technics	20 (covering 3 institutes)
Nationalities	over 30
Research groups	16

Education



Postgraduate courses	
CAS Clinical Research in Health Care Organizations	CAS
Leadership in Health Care Organizations	
CAS Managing Medicine in Health Care Organizations	
MAS in Leading Learning Health Care Organizations	
Swiss Epidemiology Winter School	
Inter University Public Health Education	
MPH, DAS, CAS	
Medical Specialist in Prevention and Public Health	
Certified training facility	
Bern Lectures in Health Science	
10 monthly seminars plus 6 special talks	

Grants



Grants, new in 2022	
• Swiss National Science Foundation (SNSF):	
1 Starting Grant, 2 project grants (320030_212519, IZSEZO_213181), 1 Postdoc Mobility	
• 1 Horizon Europe and 1 Secretariat for Education Research grant	
• Swiss Cancer League, 4 Multidisciplinary Center for Infectious Diseases grants, 1 Swiss Personalized Health Network grant	
3rd Party money spent	
SNSF	CHF 3'835'325
Other competitive	CHF 5'625'849
Non-competitive	CHF 3'110'159

Publications



Originals in house	107
Original collaborations	128
Reviews in house	8

Teaching



Total numbers	
Courses	66
Course attendees	962
Undergraduate lectures	713



Reports
from
Research
Groups

Cancer

We study the occurrence of and risk factors for cancer, and we inform cancer prevention programs. The group currently focuses on the epidemiology of HIV-related malignancies and cervical cancer prevention, treatment, and survival in sub-Saharan Africa.

Key scientific activities

We continued our work analyzing data from the South African HIV Cancer Match (SAM) study – a record-linkage study based on laboratory records from the National Health Laboratory Service and cancer diagnoses from the National Cancer Registry in South Africa. The current SAM study database includes information about more than 5 million people living with HIV. We used data from the SAM study to examine the association of age and cancer risk among this population, and we enriched the SAM database by obtaining vital status information from the National Population Register for a subset of individuals.

We used a South African medical aid claims database to assess the impact of HIV status on cervical cancer survival. In Zambia, we followed up women who previously participated in a diagnostic test accuracy study of a portable colposcope for the detection of cervical intraepithelial neoplasia to examine human papillomavirus (HPV) and cervical disease dynamics over time for this cohort. In Zimbabwe, we worked on setting up a prospective cohort study on cervical pre-cancer treatment failure among women living with HIV.

Key academic activities

Students: Yannick Turdo completed his MD thesis on cervical cancer survival in South Africa. John Andoh started his PhD work developing a mathematical model for assessing comparative effectiveness and cost-effectiveness of different cervical cancer prevention strategies in Zambia.

Teaching: We taught and tutored medical students at the University of Bern. Eliane Rohner coordinated the medical specialization program in prevention and public health at the Institute of Social and Preventive Medicine.

Conferences and Events: We participated in and contributed to the Steering Group Meeting of the International epidemiology Databases to Evaluate AIDS Southern Africa (leDEA-SA) from November 14–16, 2022 in Johannesburg, South Africa.

Scientific talks and presentations: Yann Ruffieux presented research results at 2 virtual conferences: the Conference on Retroviruses and Opportunistic Infections and the International Conference on Malignancies in HIV/AIDS. Yannick Turdo presented research results at the International AIDS Conference in Montréal, Canada.

Honors and Awards: Yannick Turdo obtained a scholarship to attend the International AIDS Conference in Montréal, Canada.

Grants

National Institute of Allergy and Infectious Diseases (Administrative Supplement to U01AI069924): Enriching the South African HIV Cancer Match study to include vital status information and an HIV-negative control cohort (PI: Matthias Egger; Project Lead: Eliane Rohner; 2022–2023).

Internal and external collaborations

In Switzerland, we collaborate with the Swiss Institute for Translational and Entrepreneurial Medicine (sitem-insel; Rowan Iskandar); the Swiss Tropical and Public Health Institute (Julia Bohlius); and the Swiss HIV cohort study (Karoline Aebi-Popp). Internationally, we collaborate with the International epidemiology Databases to Evaluate AIDS – Southern Africa (leDEA-SA); the National Cancer Registry (Mazvita Muchengeti), South Africa; the University of Cape Town (Gary Maartens), South Africa; the World Health Organization's International Agency for Research on Cancer (Partha Basu), France; the Newlands Clinic (Margaret Pascoe, Tarisai Kufa, Tinei Shamu), Zimbabwe; the Center for Infectious Disease Research (Albert Manasyan, Misinzo Moono), Zambia; and the Molecular Epidemiology Laboratory at the Queen Mary University (Belinda Nedjai), UK.

Key team members

John Andoh (PhD candidate); Matthias Egger (head of HIV, hepatitis, and tuberculosis research group); Nathalie Fernandez (research fellow); Eliane Rohner (head of research group); Yann Ruffieux (research associate); Katayoun Taghavi (postdoc); Yannick Turdo (research assistant).

Selected publications

Iskandar R, **Taghavi K**, **Low N**, Bramer WM, **Egger M**, **Rohner E**. **Mathematical models for evaluating effectiveness and cost-effectiveness of cervical cancer control policies in populations including women living with HIV: A scoping review**. Value Health Reg Issues. 2022; 32:39–46.

Muchengeti M, **Bartels L**, Olago V, Dhokotera T, Chen WC, **Spoerri A**, **Rohner E**, Bütikofer L, **Ruffieux Y**, Singh E, **Egger M**, Bohlius J. **Cohort profile: the South African HIV Cancer Match (SAM) study, a national population-based cohort**. BMJ Open 2022; 12(4):e053460.

Ruffieux Y, Muchengeti M, Olago V, Dhokotera T, Bohlius J, **Egger M**, **Rohner E**. **Age and cancer incidence in 5.2 million people with HIV: the South African HIV Cancer Match study**. Clin Infect Dis. 2022.

Taghavi K, Mandiriri A, Shamu T, **Rohner E**, Bütikofer L, Asangbeh S, Magure T, Chimbetete C, **Egger M**, Pascoe M, Bohlius J. **Cervical cancer screening cascade for women living with HIV: A cohort study from Zimbabwe**. PLOS Glob Public Health. 2022;2(2):e0000156.

Turdo YQ, **Ruffieux Y**, Boshomane TMG, Mouton H, **Taghavi K**, **Haas AD**, **Egger M**, Maartens G, **Rohner E**. **Cancer treatment and survival among cervical cancer patients living with or without HIV in South Africa**. Gynecol Oncol Rep 2022;43:101069.

Cardiometabolic Research

Our research group puts epidemiologic principles into practice in clinical and public health environments. We aim to develop better prevention and detection tools for cardiometabolic diseases, such as type 2 diabetes and cardiovascular disease.

Our main research themes include 1) determining sex differences in cardiometabolic diseases; 2) understanding the link between diabetes and cardiovascular disease; and 3) quantifying the burden of cardiometabolic diseases in spinal cord injury (SCI).

Key scientific activities

Within women's health, our research group showed women increase their levels of traditional cardiovascular risk factors as they grow older – a change similar across different reproductive stages. Although our genetic findings do not support the hypothesis that early onset of menopause is associated with higher blood pressure, they do suggest different ages of natural menopause-related genetic pathways could differently impact blood pressure. Preliminary data from our team shows iron biomarkers vary by sex and age; they can also partially mediate the levels of Nt-proBNP – a prognostic marker for heart failure.

In the area of diabetes and cardiovascular disease, our research highlights people with diabetes possibly experiencing reduced recognition of atrial fibrillation symptoms, which may result in a delayed diagnosis of atrial fibrillation. Consequently, reduced recognition of atrial fibrillation symptoms also brings more complications, such as stroke. In addition, patients with diabetes may be more at risk of developing non-paroxysmal atrial fibrillation rather than paroxysmal atrial fibrillation.

Our SCI findings suggest 1) the level of injury as possibly an additional non-modifiable cardiovascular disease risk factor in chronic SCI (we reported distinct lipid profile, blood pressure, and body composition among individuals with tetra- as compared with paraplegia) and 2) the burden of cardiometabolic diseases among individuals with non-traumatic injury as possibly higher compared with traumatic injury.

Our Chagas disease research also recently showed a dehydroepiandrosterone sulfate (DHEA-S) and circulating MicroRNAs, such as miR-223-5p, possibly plays a prognostic role in Chagas cardiomyopathy.

From a lifestyle viewpoint, our research suggest high oat intake possibly improves several cardiometabolic risk markers, yet hard outcome evidence, such as for diabetes and cardiovascular disease, is limited. While buckwheat may have some beneficial effects on glucose, our research calls for large and better-quality studies to understand effects of buckwheat on cardiometabolic risk.

Key academic activities

Teaching: Lectures in Sex- and Gender-Specific Medicine, clinical epidemiology, public health, systematic reviews and meta-analyses, and grading of recommendations, assessment, development, and evaluation – GRADE – assessment.

Grants

UNIBE Initiator Grant: Diabetes and atrial fibrillation, novel insights through epidemiological approaches, (CHF 19,943, PI: Arjola Bano; 2022–2023).

Swiss National Science Foundation (IZLIZ3_200256). Sex and menopausal differences in iron status/biomarkers as potential causative factor contributing to sex differences in cardio- metabolic disease (IRONNES), (CHF 350,000; PI: Taulant Muka; 07/2021–06/2024).

Leading House for the Latin American Region, Switzerland. Predictive value of novel circulating biomarkers in Chagas disease: the Brazilian Chagas disease cohort, (CHF 23,670; PI: Marija Glisic; 07/2021–07/2022).

Swiss Federal Commission for Scholarships. 3 Swiss Government Excellence PhD Scholarships (supervisor: Taulant Muka).

Internal and external collaborations

Department of Cardiology, University Hospital of Bern, Inselspital; Department of Angiology, Inselspital; Meta Research Innovation Center at Stanford (METRICS), Stanford University, USA; Swiss Paraplegic Research, Nottwil, Switzerland; CoLaus Study, University of Lausanne, Switzerland; Imperial College London, UK; Department of Epidemiology, Erasmus Medical Center, Rotterdam, The Netherlands; PREVEND Study, University of Groningen, The Netherlands; Department of Public Health and Clinical Medicine, Umeå University, Sweden.

Key team members

Noushin Sadat Ahanchi (PhD candidate); Arjola Bano (postdoc); Jackie Buttia (research fellow); Zayne Roa Díaz (PhD candidate); Helga Dizdari (research fellow); Marija Glisic (head of lifestyle and behaviour research group); Giorgia Grisotto (PhD candidate); Oche Adam Itodo (PhD candidate); Lum Kastrati (PhD candidate); Farnaz Khatami (PhD candidate); Taulant Muka (head of research group); Sergio Gómez Ochoa (research fellow); Hugo Quezada (PhD candidate); Hamidreza Raeisi (PhD candidate); Peter Francis Raguindin (PhD candidate); Dante Salvador Jr (PhD candidate); Stevan Stojic (research fellow); Faina Wehrli (postdoc).

Selected publications

Grisotto G, Langton CR, Li Y, Bertone-Johnson ER, Baden MY, **Franco OH**, Hu FB, **Muka T**, Eliassen AH. **Association of plant-based diet and early onset of natural menopause.** Menopause. 2022;29(7):861–7.

Itodo OA, Flueck JL, **Raguindin PF**, Stojic S, Brach M, Perret C, **Minder B**, **Franco OH**, **Muka T**, Stucki G, Stoyanov J, **Glisic M**. **Physical activity and cardiometabolic risk factors in individuals with spinal cord injury: a systematic review and meta-analysis.** Eur J Epidemiol. 2022;37(4):335–65.

Mesa-Vieira C, **Haas AD**, **Buitrago-García D**, **Roa Diaz ZM**, **Minder B**, **Gamba M**, **Salvador D, Jr.**, Gómez D, Lewis M, González-Jaramillo WC, Pahud de Mortanges A, **Buttia C**, **Muka T**, Trujillo N, **Franco OH**. **Mental health of migrants with pre-migration exposure to armed conflict: a systematic review and meta-analysis.** Lancet Public Health. 2022;7(5):e469–e81.

Rojas LZ, **Gómez-Ochoa SA**, Echeverria LE, Bautista-Nino PK, Hunziker L, Eisenga MF, **Muka T**. **Circulating DHEA-S levels and major cardiovascular outcomes in chronic Chagas cardiomyopathy: A prospective cohort study.** Int J Cardiol. 2022 Feb 15;349:90–95.

Taneri PE, Wehrli F, **Roa Diaz ZM**, **Itodo OA**, **Salvador D**, **Raeisi-Dehkordi H**, Bally L, **Minder B**, Kieft-de Jong JC, Laine JE, **Bano A**, **Glisic M**, **Muka T**. **Association Between Ultra-Processed Food Intake and All-Cause Mortality: A Systematic Review and Meta-Analysis.** Am J Epidemiol. 2022;191(7):1323–35.

Child and Adolescent Health

Pediatric Respiratory Epidemiology, Paediatric Cancer Registry, Paediatric Cancer Epidemiology, and Paediatric Rare Disease Registry (and other studies) comprise the Child and Adolescent Health research group.

1. Pediatric Respiratory Epidemiology Group

The Pediatric Respiratory Epidemiology group studies common and rare respiratory disorders during childhood and over the life-course. Our main areas of interest are asthma and other wheezing disorders, chronic cough, cystic fibrosis (CF), and primary ciliary dyskinesia (PCD). We look into the role of environmental and behavioral influences on the development of respiratory disorders, the prediction of clinical course, and phenotypes of diseases, such as asthma and PCD.

Key scientific activities

We conduct population-based and clinical cohort studies and registries.

Swiss Paediatric Airway Cohort (SPAC): SPAC is a prospective observational national, multi-center clinical cohort study, including more than 4,000 children referred to paediatric respiratory outpatient clinics for wheeze, cough, exercise, and sleep-related respiratory problems. In 2022, we studied phenotypes of cough among children; we reported facemask use did not lead to carbon dioxide retention when children exercise; we studied predictors of asthma control and asthma attacks; and we studied the utility of the Predicting Asthma Risk in Children (PARC) tool to predict outcomes among this population.

Luftibus in the School: Luftibus is a population-based study about respiratory health among school-aged children in canton Zürich. In 2022, we reported determining the prevalence of cough among children depends strongly on the question asked, and we studied phenotypical characteristics of children who cough at night.

National monitoring of newborn screening (NBS) for CF: NBS monitoring describes methods and results of CF in Switzerland. In 2022, we published a 10-year report, and we compared NBS programs across Europe.

Swiss PCD registry (CH-PCD): In 2022, we published information on the frequency of upper and lower respiratory symptoms and physical activity of people with PCD in Switzerland using patient-reported information. We also sent a new questionnaire to participants to study longitudinal changes in respiratory symptoms, assess frequency of neonatal problems, and evaluate treatments taken by people with PCD. Lastly, we wrote and circulated the first comprehensive report for registry participants.

COVID-PCD: COVID-PCD is an online longitudinal participatory study including more than 700 people with PCD of all ages from all over the world. Since recruitment started in May 2020, participants completed regular questionnaires. In 2022, we studied factors associated with incidence and severity of reported SARS-CoV-2 infections, and we studied vaccinations against COVID-19. We also investigated topics unrelated to COVID-19 and studied diagnostic testing and fertility counseling around the world.

Ear-Nose-Throat (ENT) Prospective International Cohort of PCD patients (EPIC-PCD): EPIC-PCD is a multi-center cohort study on characteristics and prognosis of upper respiratory disease among patients with PCD, which currently includes 466 participants from 13 centers in 10 countries. In 2022, we analyzed and presented data on frequency and characteristics of sinonasal and otologic patient-reported symptoms and results of ENT specialized examinations.

Research priorities in PCD: A mixed-methods study combining qualitative and quantitative analytical approaches to determine future priorities for clinical and epidemiological research on PCD. In 2022, we analyzed data from semi-structured interviews with experts in the field, interviewed people with PCD and parents of children with PCD from Switzerland and the United Kingdom, and started developing 2 surveys on research priorities based on our interview analysis results, which we plan to circulate widely among experts, participants, and participant families worldwide.

BEAT-PCD Clinical Research Collaboration: Since 2020 the European Respiratory Society (ERS) funds BEAT-PCD Clinical Research Collaboration (CRC) – a network of multidisciplinary researchers and clinicians. The CRC coordinates research from basic science to clinical care to improve diagnosis and develop treatments that lead to better long-term outcomes for patients with PCD. Myrofora Goutaki cochairs the network, Claudia Kuehni is a member of the management committee, and Yin Ting Lam is a PhD student representative on the advisory board. Within the BEAT-PCD framework in 2022, we developed and progressed numerous research projects, and we applied for renewal of ERS support. The network also organized a successful international annual meeting and training school for early career researchers and co-organized the first international conference for people with PCD together with PCD support groups worldwide and the European Lung Foundation (ELF).

Key academic activities

Students: During 2022, the group included 7 PhD candidates and 2 masters students.

Teaching: Regular teaching with lectures and tutoring of undergraduate and postgraduate students (University of Bern, Master of Public Health program) by Claudia Kuehni, Myrofora Goutaki, and Eva Pedersen.

Conferences and Events: Co-organization of the annual meeting of BEAT-PCD CRC and BEAT-PCD training school in Barcelona (September 2022), the annual Swiss PCD meeting in Bern (November 2022), and the first online international PCD patient conference (December 2022).

Scientific Talks and Presentations: As invited speakers, Leonie Schreck and Yin Ting Lam presented their talk, "Studie COVID19-PCD – eine Studie von und für Menschen mit PCD – und weitere Forschungsprojekte" at the patient congress of the German support group for PCD (Kartagener Syndrom und Primäre Ciliäre Dyskinesie) on May 7, 2022, in Berlin, Germany.

During ERS BEAT-PCD annual meeting on September 3, 2022 in Barcelona, Spain, invited speakers Leonie Schreck and Yin Ting Lam presented "COVID-PCD study" and "Upper airways disease in PCD, EPIC-PCD study."

At the annual meeting of Gesellschaft für Pädiatrische Pneumologie (GPP) on September 29, 2022 in Bern, Switzerland, Eva Pedersen delivered her invited talk, "Participatory research and [patient and public involvement] PPI: how to include patients into research? The example of COVID-PCD."

Honors and Awards: In May 2022 in Luzern, Switzerland, Yin Ting Lam won the award for best oral presentation at the annual congress of the Swiss Society of Paediatric Pulmonology and Eva Pedersen won the award for best publication by a young researcher from the Swiss Lung Association Research Fund.

In September 2022 at the annual ERS Congress in Barcelona, Spain, Myrofora Goutaki won the award for best abstract for the Paediatric Assembly and Eva Pedersen won the ELF-sponsored award for best abstract in patient-centered research.



Grants

Swiss National Science Foundation (320030B_192804): Natural history, phenotypes, and disease classification in primary ciliary dyskinesia (phase II). (CHF 447,055; PI: Claudia Kuehni; 05/2020–05/2023).

Swiss National Science Foundation (320030_212519): Using real-world data for diagnosis and prognosis of childhood asthma. (CHF 1.2 million; PI: Claudia Kuehni; 2022–2026).

Swiss National Science Foundation Ambizione (PZ00P3_185923): From the nose to the lungs: the importance of upper respiratory disease in Primary Ciliary Dyskinesia. (CHF 950,341; PI: Myrofora Goutaki; 2019–2023).

Swiss National Science Foundation: Measures for researchers from Ukraine for PhD student Tayisiya Krasnova. (CHF 110,917; host: Claudia Kuehni; 2022–2024)

Swiss Lung League: Phenotypes of Primary Ciliary Dyskinesia and their association with genotypes and disease progression. (CHF 86,082; PI: Eva SL Pedersen; 2021–2024).

Johanna Dürmüller-Bol: Treatment burden of people with PCD in Switzerland. (CHF 12,646; PI: Myrofora Goutaki).

OM Pharma Clinical Research Grant Agreement: Assessing the impact of COVID-19 preventive measures on respiratory infections and wheezing episodes in children. (CHF 93,887; PI: Claudia Kuehni).

Internal and external collaborations

The Paediatric Respiratory Epidemiology group works with an extensive national and international multidisciplinary network of researchers, clinicians, and scientists in the field of paediatric and rare respiratory diseases. We also collaborate closely with patient associations and support groups through projects, such as SPAC and COVID-PCD, and research initiatives, such as BEAT-PCD CRC.

Key team members

Cristina Ardura-García (postdoc); Daria Berger (PhD candidate); Noah Forster (master student); Labinota Gjokaj (research assistant); Myrofora Goutaki (senior researcher); Daniela Knup (research assistant); Mirjam Koller (master student); Helena Koppe (research assistant); Tayisiya Krasnova (PhD candidate); Claudia Kuehni (head of research group); Yin Ting Lam (PhD candidate); Gia Thu Ly (research assistant); Ronny Makhoul (PhD candidate); Maria Christina Mallet (PhD candidate); Eva Sophie Lunde Pedersen (postdoc); Lara Pissini (research assistant); Meret Ryser (research assistant); Leonie Schreck (PhD candidate); Ibrahim Ssekalo (PhD candidate).



Claudia Kuehni



Cristina Ardura-García



Daria Berger



Labinota Gjokaj



Myrofora Goutaki



Daniela Knup



Helena Koppe



Tayisiya Krasnova



Yin Ting Lam



Eva Sophie Lunde Pedersen



Gia Thu Ly



Maria Christina Mallet



Ronny Makhoul



Meret Ryser



Leonie Schreck



Ibrahim Ssekalo

Selected publications

Berger DO, Pedersen ESL, Mallet MC, de Jong CCM, Usemann J, Regamey N, Spycher BD, Ardura-García C, Kuehni CE; SPAC Study Team. External validation of the Predicting Asthma Risk in Children tool in a clinical cohort. *Pediatr Pulmonol.* 2022;57(11):2715–23.

Halbeisen FS, Pedersen ESL, Goutaki M, Spycher BD, Amirav I, Boon M, Cohen-Cymberek M, Crowley S, Emiralioglu N, Haarman EG, Karadag B, Koerner-Rettberg C, Latzin P, Loebinger MR, Lucas JS, Mazurek H, Morgan L, Marthin J, Pohunek P, Santamaria F, Schwerk N, Thouvenin G, Yiallourous P, Nielsen KG, Kuehni CE. Lung function from school age to adulthood in primary ciliary dyskinesia. *Eur Respir J.* 2022;60(4).

Goutaki M, Hüsler L, Lam YT, Koppe HM, Jung A, Lazor R, Müller L; Swiss PCD Research Group, Pedersen ESL, Kuehni CE. Respiratory symptoms of Swiss people with primary ciliary dyskinesia. *ERJ Open Res.* 2022;8(2):00673–2021.

Lam YT, Pedersen ESL, Schreck LD, Hüsler L, Koppe H, Belle FN, Clarenbach C, Latzin P; Swiss PCD research group, Kuehni CE, Goutaki M. Physical activity, respiratory physiotherapy practices, and nutrition among people with primary ciliary dyskinesia in Switzerland – a cross-sectional survey. *Swiss Med Wkly.* 2022;152:w30221.

Mallet MC, Hitzler M, Lurà M, Kuehni CE, Regamey N. Facemasks do not lead to abnormal gas exchange during treadmill exercise testing in children. *ERJ Open Res.* 2022;8(1):00613–2021



2. Paediatric Cancer

2.a Childhood Cancer Registry (ChCR)

The Cancer Registration Act (CRA) came into effect in Switzerland on January 1, 2020, which makes cancer diagnosis registration compulsory. The Federal Office of Public Health (FOPH) transferred the task to manage the national ChCR to the consortium of the Swiss Paediatric Oncology Group (SPOG) and the Institute of Social and Preventive Medicine (ISPM) at the University of Bern.



ISPM maintains and hosts the ChCR, reports national data, and collaborates internationally with data about cancer among children and adolescents in Switzerland.

ChCR registers diagnoses of cancer among children and adolescents under age 20 in Switzerland, monitors incidence of childhood cancers, quality of care and long-term outcomes. ChCR data support etiological, epidemiological, and outcome research. Further information is available on the ChCR website.

Key scientific activities

The data from the ChCR build the basis for national evaluations, international monitoring, and benchmarking, as well as supporting childhood cancer research in Switzerland. For this reason, our team's key tasks comprise registering, coding, and ensuring data quality (RCD).

ChCR is also responsible for securely delivering registry data to international benchmarking and monitoring studies for childhood cancer cases. In 2022, the ChCR prepared data delivery for 5 requests from international childhood cancer organizations for registry data.

The management change from the former Swiss Childhood Cancer Registry (SCCR; since 1976 on a voluntary basis) to the ChCR after CRA enforcement is still ongoing. The Federal Office of Information Technology, Systems, and Telecommunication continues the development of the new registration software.

We began preparatory work for Public Health Report 2024 on the risk of secondary primary cancers.

ChCR finalized the harmonized methodology documentation for national cancer reporting among adults, children, and adolescents together with the Federal Statistical Office (FSO) and the National Agency for Cancer Registration (NACR). The documentation includes a description of data sources and standards for routine statistical analyses and cancer reporting. We published the final document – Statistical Methods for Cancer Reporting in Switzerland – on our website.

Our website includes routine analyses of ChCR data.

Key academic activities

Teaching: ChCR participated in teaching SPOG Clinical Research Coordinators during the annual 1-day teaching event.

Scientific Talks and Presentations: In November 2022 in Basel, we participated in the Swiss Oncology and Hematology Congress. Ben Spycher presented “Dealing with suspected cancer clusters: small-area-level surveillance of childhood CNS [central nervous system] tumors in Switzerland” during the Oncosuisse “Krebsregistrierung in der Schweiz” session.

Grants

Swiss Federal Office of Public Health: The Childhood Cancer Registry of Switzerland is mandated and completely funded by the FOPH.

Internal and external collaborations

At ISPM, we collaborate with the Child and Adolescent Health research group. Within Switzerland, we collaborate with FOPH; NACR; SPOG; Association Suisse des Registres du Cancer; and FSO.

Outside of Switzerland, we collaborate with the International Association of Cancer Registries; European Network of Cancer Registries; and German Childhood Cancer Registry.

Key team members

Valentin Bunjaku (assistant RCD); Christina Çinar-Kaufmann (registration and coding); Daniela Dyntar (head RCD quality); Katharina Flandera (administrative support); Zina Heg-Bachar (registration); Ursula Kühnel (executive coordinator); Claudia Kuehni (head of Childhood Cancer Registry); Eleftheria Michalopoulou (statistics); Erika Minder (registration and coding); Shelagh Redmond (data quality); Grit Sommer (head of data requests); Ben Spycher (head of statistics).



Claudia Kuehni



Valentin Bunjaku



Christina Çinar-Kaufmann



Daniela Dyntar



Katharina Flandera



Anna Glenck



Zina Heg



Ursula Kühnel



Eleftheria Michalopoulou



Erika Minder



Shelagh Redmond



Sara Pavic



Grit Sommer



Ben Spycher

Selected publications

Abawi K, Feller A, Lorez M, **Michalopoulou E**, Roy E, **Spycher B**, Weitkunat R. **Statistical Methods for Cancer Reporting in Switzerland**. Version 1.0. 2022.

Ssenyonga N, Stiller C, Nakata K, Shalkow J, **Redmond S**, Bulliard JL, Girardi F, Fowler C, Marcos-Gragera R, Bonaventure A, Saint-Jacques N, Minicozzi P, De P, Rodríguez-Barranco M, Larønningen S, Di Carlo V, Mägi M, Valkov M, Seppä K, Wyn Huws D, Coleman MP, Allemani C, **Kuehni CE** (Member of CONCORD-3 Working Group). **Worldwide trends in population-based survival for children, adolescents, and young adults diagnosed with leukaemia, by subtype, during 2000-14 (CONCORD-3): analysis of individual data from 258 cancer registries in 61 countries**. *Lancet Child Adolesc Health*. 2022;6(6):409–431.

2.b Paediatric Cancer Epidemiology

The Paediatric Cancer Epidemiology group studies the effects of childhood cancer over the life-course. Our main areas of interest concern long-term outcomes after childhood cancer, including prevalence, incidence, and spectrum of somatic and psychosocial late effects, such as cardiac and pulmonary dysfunction, somatic health, mental health, educational and social outcomes, health-related quality-of-life, secondary neoplasms, and long-term mortality.

Key scientific activities

We conduct population-based clinical follow-up studies on long-term outcomes after childhood cancer.



Swiss Childhood Cancer Survivor Study (SCCSS): A nationwide population-based questionnaire survey continuously enrolling all patients with childhood cancer registered in the Childhood Cancer Registry who survive more than 5 years after their cancer diagnosis. We study the spectrum of somatic and psychosocial outcomes childhood cancer survivors experience, health-related quality-of-life, and health behaviors. In 2022, we contacted all survivors diagnosed between 2011–2015 and their siblings. We additionally conducted a follow-up survey of survivors who already participated in a previous survey to assess changes in health status over time. SCCSS-Nutrition is a sub-study which collects dietary information via urine samples and self-reported questionnaires from survivors.

Cardiovascular Late Effects after Childhood Cancer (CardioOnco) Study: A prospective longitudinal multi-center study. It compares conventional echocardiography with speckle tracking echocardiography for the early detection of cardiac disease among childhood cancer survivors and investigates clinical determinants for developing cardiac disease after childhood cancer. The study started in 2016 at the University Hospital of Bern, Inselspital and since 2021 it expanded to 4 other centers in Switzerland.

Community-based screening program for hearing loss after childhood cancer: A prospective study evaluating access to novel, low-threshold hearing tests for former patients with childhood cancer. We invite patients with childhood cancer at risk of hearing loss for a free hearing test in a local hearing aid shop. The study has a participatory approach through a stakeholder advisory group of former patients, physicians, and hearing experts. We use questionnaires, interviews, and group discussions with all stakeholders to evaluate the screening program.

Genetic risks for Complications in Children after Oncological Treatment in Switzerland (GECCOS): As a project to find genetic risk factors of complications after childhood cancer, we collected more than 500 germline DNA samples in the Biobank for Childhood Cancer and Blood Disorders. We extracted and sequenced DNA from participants with childhood cancer in Switzerland to contribute to international research collaborations on second cancers. GECCOS help us better understand why some people develop second cancers after childhood cancer and others do not.

International Late Effects of Childhood Cancer Guideline Harmonization Group (IGHG): An initiative developing standardized recommendations for follow-up surveillance after childhood cancer. Our research group leads a guideline on pulmonary dysfunction, and



we are involved in several other guidelines related to ototoxicity, metabolic syndrome, psychosocial problems, and health promotion.

Swiss Paediatric Haematology/Oncology Metabank (Biolink): A project providing a platform to combine data from the SCCSS and 2 biobanks in a privacy-preserving way: the Swiss germline DNA Biobank for Childhood Cancer and Blood Disorders and the Swiss Pediatric Haematology Oncology Biobank Network. The Metabank facilitates project development through the rapid assessment of available data and samples, then links clinical data with biosamples. Biolink enables in depth research in the fields of cancer predispositions, pharmacogenetics, and genetic modifiers of long-term complications after childhood cancer.

Pulmonary Late Effects after Childhood Cancer (Pulmo Study, SCCSS FollowUp): A prospective longitudinal multi-center study. It is embedded in the SCCSS FollowUp study that collects data from regular follow-up visits of pediatric childhood cancer survivors. The Pulmo Study compares conventional lung function tests with nitrogen multiple breath washout tests for early detection of pulmonary disease among childhood cancer survivors and to understand clinical determinants that lead to the development of pulmonary disease after childhood cancer. The study started in 2022 at Inselspital and University Children's Hospital of Basel, UKBB. Expansion to 2 additional centers in Switzerland is in progress.

Key academic activities

Students: During 2022, the group included 4 MD-PhD students and 2 MD-Master of Science (MSc) students. Marc-Andrea Heinzemann and Seraina Uhlmann both successfully finished their MD-MSc thesis projects.

Teaching: Regular teaching with lectures and tutoring of undergraduate and postgraduate students (University of Bern) by Claudia Kuehni, Luzius Mader, Sven Strebel, and Tomáš Sláma.

Conferences and Events: Our team visited the International Cancer Survivorship Symposium (ICSS) in Bern, Switzerland; the International Symposium on Late Complications after Childhood Cancer in Utrecht, The Netherlands; and the 54th Annual Congress of the International Society of Paediatric Oncology in Barcelona, Spain with several oral and poster presentation by team members.

Outreach and Representation: The SCCSS celebrated its 15th anniversary in 2022. For such an occasion, important stakeholders gathered and together we reflected on major achievements and planned future activities.

Honors and Awards: Sven Strebel won the Scientific Research Award for the best oral presentation at the ICSS in Bern (CHF 5,000).

Grants

Swiss Cancer Research and Swiss Cancer League (KLS/KFS-4825-01-2019): Structural funding for Swiss Childhood Cancer Survivor Study. (CHF 480,000; PI: Claudia Kuehni; 01/2020–12/2022).

Kinderkrebshilfe Schweiz: Swiss Childhood Cancer Survivor Study. (CHF 50,000; PI: Claudia Kuehni, Nicolas von der Weid; 01/2022–12/2022).

Swiss Cancer Research (KFS-4722-02-2019): Dietary intake, overweight, and late effects development in childhood cancer survivors (CHF 359,450; PI: Murielle Bochud, Co-Applicant: Claudia Kuehni; 07/2019–06/2022).

Swiss Cancer Research (KFS-5027-02-2020): Early detection of heart disease after treatment for cancer during childhood. (CHF 336,950; PI: Nicolas von der Weid, Co-Appllicants: Claudia Kuehni, Christina Schindera; 01/2021–12/2023).

Swiss Cancer Research (HSR-4951-11-2019): Improving access to screening for hearing loss after childhood cancer – a novel community-based approach. (CHF 247,850; PI: Claudia Kuehni; 05/2020–10/2023).

Swiss Cancer Research (KFS-5302-02-2021): Pulmonary dysfunction after childhood cancer: assessing early-stage disease (phase II). (CHF 369,150; PI: Claudia Kuehni; 07/2021–06/2024).

Stiftung für krebskranke Kinder, Regio Basiliensis: Prospective Multicentre Cohort Study for Diagnosing Cardiac Dysfunction in Childhood Cancer Survivors. (CHF 70,000; PI: Christina Schindera).

University of Basel Research Fund for Excellent Junior Researchers: Prospective Multicentre Cohort Study for Diagnosing Cardiac Dysfunction in Childhood Cancer Survivors (CHF 80,000; PI: Christina Schindera).

Internal and external collaborations

The Paediatric Cancer Epidemiology group works with an extensive national and international multidisciplinary network of researchers and clinicians in the field of late effects after childhood cancer. In Switzerland, we collaborate with Swiss Paediatric Oncology Group's 9 paediatric oncology clinics. Internationally, we are partners in several collaborative projects, such as PanCareSurFup and PanCareLIFE.

Key team members

Fabiën Belle-van Sprundel (postdoc); Katharina Fessler (research assistant); Philippa Jörger (PhD candidate); Claudia Kuehni (head of research group); Luzius Mader (research fellow); Selma Riedo (project coordinator); Christina Schindera (postdoc); Tomáš Sláma (PhD candidate); Sven Strebel (PhD candidate); Leah Weber (research assistant); Maša Žarković (PhD candidate); Andrea Ziörjen (study nurse).



Claudia Kuehni



Fabiën Belle-van Sprundel



Luzius Mader



Philippa Jörger



Selma Riedo



Christina Schindera



Sven Strebel



Tomáš Sláma



Leah Weber



Andrea Ziörjen



Maša Žarković



Selected publications

Belle FN, Sláma T, Schindera C, Diesch T, Kartal-Kaess M, **Kuehni CE, Mader L.** *Body image in adolescent survivors of childhood cancer: the role of chronic health conditions.* *Pediatr Blood Cancer* 2022;69(11): e29958.

Kasteler R, Otth M, Halbeisen FS, **Mader L,** Singer F, Rössler J, von der Weid NX, Ansari M, **Kuehni CE.** *Longitudinal assessment of lung function in Swiss childhood cancer survivors.* Preprint from medRxiv. 2022; doi.org/10.1101/2022.03.16.22272460

Mader L, Sláma T, Schindera C, Rössler R, **von der Weid NX, Belle FN, Kuehni CE.** *Social, emotional, and behavioural functioning in young childhood cancer survivors with chronic health conditions.* *Pediatr Blood Cancer* 2022;(69)9:e29756.

Strebel S, Mader L, Sláma T, Waespe N, Weiss A, Parfitt R, am Zehnhoff-Dinnesen A, Kompis M, **von der Weid NX,** Ansari M, **Kuehni CE.** *Severity of hearing loss after platinum chemotherapy in childhood cancer survivors.* *Pediatr Blood Cancer* 2022;69(9):e29755.

Sunguc C, Hawkins MM, Winter DL, Dudley IM, Heymer EJ, Teepen JC, Allodji RS, **Belle FN,** Bagnasco F, Byrne J, Bárdi E, Ronckers CM, Haddy N, Gudmundsdottir T, Garwicz S, Jankovic M, van der Pal HJH, **Mazić MČ, Schindera C,** Grabow D, Maule MM, Kaatsch P, Kaiser M, Fresneau B, Michel G, Skinner R, Wiebe T, Sacerdote C, Jakab Z, Gunnes MW, Terenziani M, Winther JF, Lähteenmäki PM, Zaletel LZ, **Kuehni CE,** Kremer LC, Haupt R, de Vathaire F, Hjorth L, Reulen RC. *Risk of subsequent primary oral cancer in a cohort of 69,460 5-year survivors of childhood and adolescent cancer in Europe: the PanCareSurFup study.* *Br J Cancer.* 2022 Nov 1. doi: 10.1038/s41416-022-02016-w. Online ahead of print.

Waespe N, Strebel S, Nava T, Uppugunduri CRS, Marino D, Mattiello V, Otth M, Gumy-Pause F, Von Bueren AO, Baleyrier F, Mader L, **Spoerri A, Kuehni CE,** Ansari M. *Cohort-based association study of germline genetic variants with acute and chronic health*

complications of childhood cancer and its treatment: Genetic Risks for Childhood Cancer Complications Switzerland (GECCOS) study protocol. *BMJ Open*. 2022;12(1):e052131.

Wang Y, Kremer LCM, van Leeuwen FE, Armstrong GT, Leisenring W, de Vathaire F, Hudson MM, **Kuehni CE**, Arnold MA, Haddy N, Demoor-Goldschmidt C, Diallo I, Howell RM, Ehrhardt MJ, Moskowitz CS, Neglia JP, van der Pal HJH, Robison LL, Schaapveld M, Turcotte LM, **Waespe N**, Ronckers CM, Teepen JC; Cohort profile: Risk and risk factors for female breast cancer after treatment for childhood and adolescent cancer: an internationally pooled cohort. *BMJ Open*. 2022;12(11):e065910.

3. Paediatric and Rare Disease Registries

The Paediatric and Rare Disease Registries group hosts several medical registries and conducts studies in different areas of pediatric epidemiology, such as endocrinology, gastroenterology, nephrology, neurology, and rare diseases.

We collect data to better understand and treat certain diseases to improve patient quality-of-life. We help answer specific research questions, recruit patients for clinical studies, and coordinate post-marketing surveillance of drugs. We promote the usability of medical data for research in pediatrics and foster communication between researchers nationally and internationally and thus disseminate knowledge.

Key scientific activities

We coordinate platforms, national registries, and cohort studies.

SwissPedRegistry is a research platform for pediatric registries and also part of SwissPedNet – the Swiss research network of clinical pediatric hubs. We provide expertise and advice for the development and conduct of epidemiological and clinical registries collecting data on children or persons of any age. We develop regulatory frameworks, methodologies, and instruments for registries and participate in national discussions and meetings on registry-relevant issues. With our work, we are a driving force in infrastructure development for clinical research in pediatrics (see SwissPedHealth and SwissPedData).

Pediatric personalized research network Switzerland (SwissPedHealth) is a joint national data stream funded by Swiss Personalized Health Network (SPHN) and Personalized Health and Related Technologies (PHRT). SwissPedHealth is a collaboration between all 5 Swiss pediatric university hospitals and the 2 cantonal hospitals in Luzern and St. Gallen. It aims to make routine clinical data in pediatrics interoperable, standardized, quality-controlled, and ready for research. The project builds on **SwissPedData** – a national pediatric harmonized core dataset defined through a SPHN infrastructure development project. The harmonized dataset collected during routine inpatient and outpatient visits improves the quality of data collected during encounters with patients. It allows fast, almost real-time use of the data for high-quality research. Currently, the dataset is being implemented in clinics.



Swiss Rare Disease Registry (SRDR): SRDR is a national, population-based registry for children and adults with rare diseases. SRDR collects a core dataset from all people with rare diseases in Switzerland—approximately 500,000 people. The SRDR constitutes a platform for rare diseases, enabling clinical and epidemiological studies and facilitating patient participation in national and international trials. In 2022, we started collecting patient data. There are 3 methods for transmitting data into the SRDR. University and cantonal hospitals have the option either of automatically transferring patient data via an application interface or manually entering patient data via our online application. In addition, patients can self-register by filling out a paper form. To meet the needs of patients in an even more targeted manner, SRDR will soon complement the paper form with an online platform for self-registration.

Swiss Registry for Neuromuscular Disorders (Swiss-Reg-NMD): Swiss-Reg-NMD is a national registry of children and adults diagnosed with Duchenne-Becker muscular dystrophy (BMD/DMD), spinal muscular atrophy (SMA), and LAMA2-related muscular dystrophy. The registry includes patients in current clinical trials and long-term follow-ups of people with these disorders. Medical data collected on SMA allows for ongoing post-marketing monitoring of new disease-modifying therapies. In 2022, SMA data was analyzed in depth for 2 of these therapies and showed both therapies as effective disease-modifying treatments for SMA in real-life conditions.

Swiss Cerebral Palsy Registry (Swiss-CP-Reg): Swiss-CP-Reg is a national registry investigating health-related issues among people with cerebral palsy (CP). It includes all individuals with CP born, treated, or living in Switzerland. The aim is to improve future care and the wellbeing of individuals with CP. In 2022, we conducted our first national survey study on concerns in the daily life of families with children and adolescents with CP. Together with orthopedic surgeons, we further developed the national hip surveillance program.

Pediatric Inflammatory Brain Disease Registry (Swiss-Ped-IBrainD): Swiss-Ped-IBrainD collects medical data about pediatric patients with inflammatory brain diseases. The dataset includes information on diagnosis, disease course, and treatment of inflammatory brain diseases. The registry promotes communication and collaboration between specialists through the Swiss-Ped-IBrainD task force. The working group consists of all local PIs involved in Swiss-Ped-IBrainD and additional specialists in the field. They implement acquired knowledge in the best interest of their patients. The registry aims to improve medical care and quality-of-life of children with inflammatory brain diseases.

Key academic activities

Students: At the end of 2021, 1 student completed her master's degree within the Swiss-Reg-NMD. In 2022, 3 students completed their master's degrees within the framework of the Swiss-CP-Reg at University Hospital of Bern, Inselspital.

Conferences and Events: Organized a field trip at the Institute of Social and Preventive Medicine (ISPM) for members of SwissPedNet to present the work of SwissPedRegistry and promote knowledge-exchange about pediatric registries (October 2022). Co-organized the Swiss Academy of Childhood Disability Research Day (January 2022).

Scientific Talks and Presentations: Participated and presented 2 posters at the European Conference on Rare Disease (June 2022, Michaela Fux, SRDR). Invited speaking at the annual Duchenne Conference Schweiz (September 2022, Anne Tschertler, Swiss-Reg-NMD). Spoke at the Research Day of the Swiss Academy of Childhood Disability (January 2022, Sandra Hunziker, Swiss-CP-Reg), the Annual Congress of the Swiss Society of Paediatrics (June 2022, Sandra Hunziker, Swiss-CP-Reg), and the Annual Meeting of the Swiss society of Neuropediatrics (December 2022, Lorena Hulliger, Swiss-Ped-IBrainD and Sandra Hunziker, Swiss-CP-Reg).



Outreach and Representation: Representatives from the group attended national and international meetings with relevant stakeholders, participated in working groups, and represented the needs and interests of pediatric registries. We conducted science communication and outreach activities related to rare diseases in general and neuromuscular disorders in particular with various patient organizations and foundations, university and cantonal hospitals, and representatives of the pharmaceutical industry. We represented the interests of SwissPedNet within the political working group for the implementation of the motion 19.4119 “Erhöhung der Arzneimittelsicherheit in der Pädiatrie. Medikationsfehler durch E-Health reduzieren” or Motion Stöckli – a parliamentary motion to increase drug safety in pediatrics through e-health using a clinical decision support system.

Honors and Awards: Sandra Hunziker received the 3rd prize in the category “finalized studies” for “Prescription Practices of Medical Cannabinoids in Children with Cerebral Palsy – A Survey of the Swiss Cerebral Palsy Registry” at the Research Day of the Swiss Academy of Childhood Disability (January 2022).

Grants

SwissPedNet: SwissPedRegistry. (CHF 80,000 per year; PI: Claudia Kuehni; 1/2021–12/2024).

Swiss Personalized Health Network and the Personalized Health and Related Technologies: Pediatric Personalized Research Network Switzerland (SwissPedHealth) – a Joint Pediatric National Data Stream. (CHF 5 million with CHF 1.083 million dedicated to ISPM; PI: Luregn Schlapbach & Julia Vogt; 09/2022–08/2025).

Swiss Federal Office of Public Health: Financial support for the Swiss Rare Disease Registry under article 24 of the national law on cancer registration. (CHF 250,000 per year; PI: Claudia Kuehni; 11/2020–10/2025).

Patient organizations and pharmaceutical companies: See Swiss-Reg-NMD for more information.

Swiss National Science Foundation (20030_212587): A mixed-methods study identifying barriers and facilitators for participation in children with cerebral palsy in Switzerland – a family perspective. (CHF 916,368; PI: Sebastian Grunt, co-PIs Anne Tschertter, Hubertus J.A. van Hedel, Christina Schulze; 2023–2026).

Schweizerische Stiftung für das Cerebral gelähmte Kind and Anna Mueller Grocholski-Stiftung: Swiss Cerebral Palsy Registry. (CHF 299,045; PI: Anne Tschertter; 2020–2024). Swiss Multiple Sclerosis Society, Johanna Dürmüller-Bol Stiftung, Anna Mueller Grocholski-Stiftung and several pharmaceutical companies: Swiss-Ped-IBrainD. (CHF 603,555 peer- and non-peer reviewed funding; PI: Sandra Bigi; 2020–2024).

Internal and external collaborations

At ISPM, we collaborate closely with medical Registries and Data Linkage (SwissRDL), particularly for data linkage and software development. In Switzerland, we work with colleagues at university and cantonal hospitals, hubs of SwissPedNet, centers for rare diseases, the kosek -Coordination Rare Diseases Switzerland, patient organizations and others. Outside of Switzerland, we collaborate with Surveillance of CP in Europe and TREAT-NMD Neuromuscular Network.

Key team members

Dominique Baumann (project manager Swiss-Reg-NMD); Natalie Bayard-Guggisberg (research assistant SRDR); Fabiën Belle-van Sprundel (project manager SwissPedHealth); Sandra Bigi (medical head Swiss-Ped-IBrain-D); Katharina Flandera (assistant); Michaela

Fux (project manager SRDR); Susanne Hofer (data manager Swiss-Ped-IBrainD, Swiss-Reg-NMD, Swiss-CP-Reg); Lorena Hulliger (project manager Swiss-Ped-IBrainD); Sandra Hunziker (research assistant Swiss-CP-Reg and SwissPedRegistry); Claudia Kuehni (head of research group, SwissPedRegistry, and SwissPedHealth); Nadine Lötscher (data manager and assistant project coordination Swiss-Reg-NMD); Anne Tschertter (senior researcher, project lead SwissPedRegistry and Swiss-CP-Reg).

Selected publications

Belle FN, Hunziker S, Fluss J, Grunt S, Juenemann S, Kuenzle C, Meyer-Heim A, Newman CJ, Ramelli GP, Weber P, Kuehni CE, Tschertter A. Cohort profile: the Swiss Cerebral Palsy Registry (Swiss-CP-Reg) cohort study. *Swiss Med Wkly.* 2022;152:w30139

Tschertter A, Rusch CT, Baumann D, Enzmann C, Hasselmann O, Jacquier D, Jung HH, Kruijshaar ME, Kuehni CE, Neuwirth C, Stettner GM, Klein A, on behalf of the Swiss-Reg-NMD group. **Evaluation of real-life outcome data of patients with spinal muscular atrophy treated with nusinersen in Switzerland.** *Neuromuscul Disord.* 2022;32(5):399–409.

Wismer AC, Rakic M, **Kuehni CE, Jaboyedoff M, Romano F, Kopp MV, Brandenberger J, Staubli G, Keitel K.** **Consensus Minimal Dataset for Pediatric Emergency Medicine in Switzerland.** *Pediatr Emerg Care.* 2022;38(10):511–6.



Climate Change and Health

The Climate Change and Health research group aims at advancing knowledge on the impact of climate change and other related environmental stressors on human health. Our main research lines develop along the intersection between epidemiology, public health, and climate sciences.

These include (1) health impact assessments of extreme weather events at different geographical scales under historical periods and future climate change scenarios; (2) identification of vulnerability profiles to climate-related health risks; (3) the impact of climate change on urban populations, modulating factors, and connections with existing challenges, such as social inequalities and aging in cities; (4) quantification of health impacts attributed to human-induced climate change; and (5) evaluation of health risks associated with compound and cascading weather events.

Key scientific activities

Coordination of international collaborations within the Multi-country Multi-city Collaborative Research network to advance knowledge on the impact of weather-related factors on mortality.

Leadership of several contributions on the impact of heat and cold on mortality, suicides and mental health in Switzerland.

Development of a methodological framework to assess risks on a small geographical scale for application in a study on temperature-related risks in England and Wales.

Key academic activities

Students: Supervision of 3 PhD students (Marvin Bundo, Evan de Schrijver, and Sidharth Sivaraj) and 2 two Master of Science (MSc) students (Vanessa Rippstein and Sujung Lee).

Teaching: Lectures in the 1st year of medicine on climate change, planetary health, and sustainability (Mensch und Umwelt). Several lectures in the MSc in Climate Science (University of Bern), including 2 seminars and a full course on environmental epidemiology applied to climate sciences.

Conferences and Events: National and international scientific events, such as the Annual Meeting of the International Society for Environmental Epidemiology and Swiss Public Health Conference.

Scientific Talks and Presentations: Keynote at "Beat the Heat" workshop (Bern, Switzerland); invited speaker for the BC3 webinar series (Spain); invited speaker for the webinar "Fostering applications on Planetary Health to the Horizon Europe programs" (ISGlobal, Spain).

Outreach and Representation: National and international scientific committees, such as the European Chapter of the International Society for Environmental Epidemiology and Environment and Health committee of the European Respiratory Society.

Grants

Medical Research Council's Population and Systems Medicine Board: Current and future temperature-related mortality and morbidity in the UK: a public health and climate change perspective. (GBP 519,950; Co-Applicant: Ana M. Vicedo-Cabrera; 10/2021–10/2024).

EU Joint Research Centre-Seville: Revisiting temperature-mortality associations using climate reanalysis data. (EUR 137,914; Collaborator: Ana M. Vicedo-Cabrera; 01/2021–08/2022).

Bretscher-Fonds – Oeschger Centre for Climate Change Research: Revisiting heat stress: assessment of the combined effect of humidity and heat on health from an epidemiological perspective; funds cover a 3.5 year PhD position. (CHF 170,000; PI: Ana M. Vicedo-Cabrera; 02/2022–08/2025).

Internal and external collaborations

University of Bern collaborators: Stefan Brönnimann (Climatology); Olivia Romppainen-Martius (Department of Geography); Thomas Müller (University of Bern); Sandra Eckert (Center for Development and Environment).

Swiss Tropical and Public Health Institute (Martina Ragetti); ETH Zürich, Switzerland (David Bresch, Erich Fischer, Sonia Seneviratne); London School of Hygiene and Tropical Medicine, UK (Antonio Gasparrini, Sir Andy Haines); CICERO Oslo, Norway (Jana Sillman and Kristin Aunan); Norwegian Institute of Public Health (Shilpa Rao); University of Valencia, Spain (Carmen Iñiguez); University of Bristol, UK (Dann Mitchell and Eunice Lo).

Key team members

Marvin Bundo (PhD candidate); Evan de Schrijver (PhD candidate); Ana M. Vicedo-Cabrera (head of research group); Sidharth Sivaraj (PhD candidate).

Selected publications

Bär S, **Bundo M, de Schrijver E, Müller TJ, Vicedo-Cabrera AM.** **Suicides and ambient temperature in Switzerland: A nationwide time-series analysis.** Swiss Med Wkly. 2022;152:w30115.

de Schrijver E, Bundo M, Ragetti MS, Sera F, Gasparrini A, Franco OH, Vicedo-Cabrera AM. **Nationwide analysis of the heat- and cold-related mortality trends in Switzerland between 1969 and 2017: The role of population ageing.** Environ Health Perspect. 2022;130(3):37001.

Gasparrini A, Masselot P, Scortichini M, Schneider R, Mistry MN, Sera F, Macintyre HL, Phalkey R, **Vicedo-Cabrera AM.** **Small-area assessment of temperature-related mortality risks in England and Wales: a case time series analysis.** Lancet Planet Health. 2022;6(7):e557–e64.

Konstantinoudis G, Minelli C, **Vicedo-Cabrera AM, Ballester J, Gasparrini A, Blangiardo M.** **Ambient heat exposure and COPD hospitalisations in England: a nationwide case-crossover study during 2007–2018.** Thorax. 2022;77(11):1098–104.
Salvador C, Vicedo-Cabrera AM, Libonati R, Russo A, García BN, Belem LBC, Gimeno L, Nieto R. **Effects of drought on mortality in macro urban areas of Brazil between 2000 and 2019.** Geohealth. 2022;6(3):e2021GH000534.

Community Health and Health Care Systems

We apply theory-driven social science methodology to understand and explain contextual conditions of health, promote and improve community health, and apply the knowledge gained to influence social determinants of health and policy-making contributing to health equity and wellbeing.

Key scientific activities

Our research identified key tools and indicators to assess and monitor participatory multisectoral urban governance for health. We contributed to methodological advancement of cocreation approaches in health sciences. We researched organizational learning for physical activity promotion in nursing home contexts.

Key academic activities

Students: PhD candidates have been working on science-policy interaction (Sophie Meyer); migrant health and smoking (Kris Schürch); and health, illness, and societal division in pandemic contexts (Cristopher Kobler Betancourt).

Three students finished their master theses and several students continue working on their Master and MD theses.

Teaching: We taught and tutored undergraduate and postgraduate students at the University of Bern (medical training, pharmacy, Master of Public Health, and PhD in Health Sciences) and gave external guest lectures and seminars.

Annika Frahsa co-supervised and mentored PhD students from the University of Bern, the University of Tübingen, Germany, and the University of Hannover, Germany.

Conferences and Events: Annika Frahsa co-organized the World Congress of Sociology of Sport: “Why does sociology matter? The role of sport sociology in interdisciplinary research” for the European Association of Sport Sociology and the International Organization of Sport Sociology in Tübingen, Germany.

Scientific Talks and Presentations: Annika Frahsa gave invited keynotes on “Co-creating active communities: Insights from participatory health research on actors, approaches, and agendas” at the 25th Conference on the Commission on Health, German Society of Sport Science (DVS) in Tübingen, Germany and “Participatory approaches in health promotion programs” at the 69th European Organization for Caries Research congress in Cagliari, Italy.

Talks and posters by group members at the World Conference of the International Union for Health Promotion and Education, Montréal, Canada (online); World Congress for the International Sociology of Sport Association and the European Association of the Sociology of Sport in Tübingen, Germany; Swiss Public Health Conference in Bern; and the Sport Science University Conference by the German Association of Sport Science.

Outreach and Representation: Annika Frahsa consulted for the Federal Office of Public Health in a series of roundtables on psychosocial determinants of health and was an invited expert on the 6th interdisciplinary DVS expert workshop on physical activity, public health science, and practice.

Honors and Awards: For her master's thesis “The Scientific Discourse on the Eligibility of Transgender Athletes and Athletes with Differences of Sex Development in Elite Sports – A Scoping Review” (supervisor: Annika Frahsa), Maïke Dernbach won the Best Sport

Science Thesis award from the alumni organization, Förderkreis des Instituts für Sportwissenschaft, at the University of Tübingen, Germany.

Grants

Multidisciplinary Center for Infectious Diseases and the Vinetum Foundation: The pandemic society in Switzerland: Polarization and public health, (CHF 719,572; PI: Annika Frahsa; co-PI: Nicola Low; 04/2022–03/2025).

German Federal Ministry of Health Research (FKZ 2519FSB114): BaSAIt- Physical activity promotion in nursing homes, (approx. EUR 1.0 million; co-PI: Annika Frahsa; 06/2019–06/2023).

United States Agency for International Development (R4D-001482-001): Forum for Advancing Better Health Policy and Systems Research Institutions (FAB HPSRIs), (USD 67,658; co-PI: Harvy Liwanag; 11/2022–08/2023).

Internal and external collaborations

At the Institute of Social and Preventive Medicine, we closely collaborate with the Palliative Care and End of Life research group, particularly teaching and advancement of qualitative methods as well as with the group on Climate Change and Health on research related to aging, community health, and climate change. With the teams of Nicola Low at ISPM and Markus Freitag at the Institute of Political Science, we conduct research on societal polarization and COVID-19. At the University of Bern, we collaborate with the Institute of Sport Science on worksite health promotion.

Within Switzerland, we collaborate with Unisanté and Université de Lausanne in the pilot Swiss Health Study and research on geo-social embeddedness and health. Internationally, we collaborate with the University of Tübingen, Germany and Friedrich-Alexander-University Erlangen-Nuremberg, Germany on physical activity among underserved groups and participatory approaches; Karlsruhe Institute of Technology, Germany on socio-ecological health models; the Department of Social Research at the University of Eastern Finland on capabilities and health. We also work with Matrix GmbH, Germany on regional health promotion structures.

We collaborate with the International Collaboration for Participatory Health Research standing committee on social participation in old age, PartNet—the network for participatory health research; and the World Health Organization's Enhanced Wellbeing Unit in Geneva on urban governance for health. We also work with institutions based in the Global South, such as in the Philippines (Ateneo de Zamboanga University and Department of Health) and in Nepal (HERD International) for research on primary care, health workforce, and health policy and systems.

Key team members

Lucia Bühlmayer (research assistant); Andrea Flükiger (personal assistant); Annika Frahsa (research group leader); Nathalia González-Jaramillo (postdoc); Cristopher Kobler Betancourt (PhD candidate); Marina Köhli (research assistant); Harvy Joy Liwanag (postdoc); Sophie Meyer (PhD candidate); Kris Schürch (PhD candidate).



Research group retreat in Eriz, Switzerland in June 2022

Selected publications

Abel T, Tadesse L, **Frahsa A**, Sakarya, S. **Integrating patient-reported experience (PRE) in a multistage approach to study access to health services for women with chronic illness and migration experience.** Health Expect. 2022;26:237–44.

Frahsa A. **Partizipation und Gesundheit – eine ZuMUTung?** Magazin Prävention & Gesundheitsförderung. Zürich: Gesundheitsdirektion Kanton Zürich; December 2022;4–7.

González-Jaramillo N, Wilhelm M, Arango-Rivas AM, **González-Jaramillo V**, **Mesa-Viera C**, **Minder B**, **Franco OH**, **Bano A.** **Systematic review of physical activity trajectories and mortality in patients with coronary artery disease.** J Am Coll Cardiol 2022;79:1690–1700.

Keygnaert I, Dias S, Stock C, **Frahsa A**, Dietrich, T, editors. **How can we Co-Create Solutions in Health Promotion With Users and Stakeholders?** Lausanne: Frontiers; 2022.

Liwanag HJ, Uy J, Politico MR, Padilla MJ, Arzobal MC, Manuel K, Cagouia AL, Tolentino P, **Frahsa A**, Ronquillo K. **Cocreation in Health Workforce Planning to Shape the Future of the Health Care System in the Philippines.** Global Health: Science and Practice. 2022;10(6):e2200176.

Environmental and Spatial Epidemiology

With a focus on cancer, we study potential effects of environmental exposures, such as ionizing radiation and traffic-related air pollution, on human health. We also explore spatial, spatio-temporal, and temporal variation in cancer incidence and mortality.

Key scientific activities

We published a study on determinants of exposure to background ionizing radiation based on measurements made from children wearing personal dosimeters. We found children's exposure tended to be higher indoors and depended strongly on building materials. As part of the EU Horizon 2020 project RadoNorm, we are conducting a collaborative study with partners from Denmark, Finland, France, and Norway on exposure to natural background radiation and the risks of childhood leukemia and tumors of the central nervous system.

We also published 2 studies investigating childhood cancer risks in relation to traffic-related air pollution. Specifically, we looked at residential exposure to ambient air concentrations of nitrogen dioxide and benzene and residential proximity to petrol stations.

In a new study funded by the Federal Office for the Environment, we are evaluating different methodological approaches for detecting changes in cancer trends potentially resulting from increased exposure to non-ionizing radiation from mobile phone use.

We also started a new project funded by the Swiss Cancer League on cancers of adolescents and young adults (AYA). The project aims to provide a first detailed description of the epidemiology of cancers among AYA (ages 15–39) in Switzerland. We plan to investigate trends in incidence and mortality for different cancer types, probability of survival, cause-specific mortality among cancer survivors, and life-time prevalence among the Swiss resident AYA population.

Key academic activities

Students: 2 medical students began their MD theses.

Teaching: Ben Spycher teaches courses in biostatistics for the medical faculty at the University of Fribourg and at Bern University of Applied Sciences. Lectures in environmental epidemiology and tutoring for first year medical students at the University of Bern by Ben Spycher and Christian Kreis.

Scientific Talks and Presentations: Oral presentations at the Childhood Cancer and Leukemia International Consortium Meeting (online, March, Ben Spycher); the Annual Congress of the Swiss Society of Paediatrics (Luzern, Switzerland; June, Ben Spycher and Claudia Kuehni); the Swiss Oncology and Hematology Congress (Basel, Switzerland; November, Ben Spycher); 7th International Workshop on the Causes of Childhood Leukemia (Munich, Germany; November, Ben Spycher).

We also presented 3 posters at the Annual Conference of the International Society for Environmental Epidemiology (Athens, Greece; September, Eleftheria Michalopolou, Christian Kreis, and Ben Spycher).

Outreach and Representation: Ben Spycher was appointed as a new member of the Scientific Council of the International Agency for Research on Cancer. Ben Spycher is a member of the academic board of Public Health Weiterbildung.

Grants

Swiss Cancer League (KLS-5432-08-2021). The epidemiology of cancer in adolescents and young adults in Switzerland. (CHF 337,400; PI: Ben Spycher; 01/2022–12/2024).

Multidisciplinary Center for Infectious Diseases. menoBalance App: Use of [artificial intelligence] methods to design a personalised chronic and infectious disease management medical device (CHF 956,890; Co-Applicant: Ben Spycher; 01/2022–12/2024).

European Commission Horizon 2020 (900009). RadoNorm. (CHF 271,700; Sub-Task Leader: Ben Spycher; 9/2020–8/2025).

Federal Office for the Environment (FOEN, 19.0094.PJ / 63372F472). Erarbeitung der Methodik für das Monitoring von Tumoren im Rahmen des NIS-Gesundheitsmonitorings. (CHF 129,900; PI: Ben Spycher; 7/2022–12/2023)

Internal and external collaborations

At the Institute of Social and Preventive Medicine, we collaborate with the Swiss National Cohort, Swiss Childhood Cancer Registry, the Child and Adolescent Health research group, and SwissRDL – Medical Registries and Data Linkage. Within Switzerland, we collaborate with Unisanté, University of Lausanne, Swiss TPH Basel, and the Swiss Paediatric Oncology Group.

Internationally, we collaborate with University of Tampere, Finland; French National Institute of Health and Medical Research (INSERM); Danish Cancer Society Research Center; UCLA Fielding School of Public Health, USA; Institute for Occupational Safety and Health of the German Social Accident Insurance; MRC Centre for Environment and Health of Imperial College London, UK; and Unité INSERM Centre Léon Bérard, France.

Key team members

Christian Kreis (postdoc); Christophe Folly (postdoc); Eleftheria Michalopolou (statistician); Jessica Laine Carmeli (postdoc); Ben Spycher (head of research group).

Selected publications

Folly CL, Mazzei-Abba A, Coste A, Kreis C, Spycher BD. Measurements and determinants of children's exposure to background gamma radiation in Switzerland. *J Radiat Res* 2022;63(3):354–63.

Kreis C, Héritier H, Scheinemann K, Hengartner H, de Hoogh K, Rösli M, Spycher BD. Childhood cancer and traffic-related air pollution in Switzerland: A nationwide census-based cohort study. *Environ Int* 2022;166:107380.

Mazzei A, Konstantinou G, Kreis C, Diezi M, Ammann RA, Zwahlen M, Kuehni C, Spycher BD. Childhood cancer and residential proximity to petrol stations: a nationwide registry-based case-control study in Switzerland and an updated meta-analysis. *Int Arch Occup Environ Health* 2022;95:927–38.

Evidence Synthesis Methods

The Evidence Synthesis Methods research group develops, applies, and disseminates methodology for synthesizing evidence from studies to answer important public health questions. We also work with prediction models to inform decision-making and support health technology assessments and guidelines.

Key scientific activities

The Mental Health during the COVID-19 Pandemic (MHCOVID) project concluded at the end of 2022. During the last 2 years, more than 100 researchers from around the world reviewed published studies to assess the trajectory of mental health symptoms during the first year of the pandemic and examined dose-response relations with characteristics of the pandemic and its containment.

We continued our work on models and application dose-effect meta-analyses. We developed dose-effect network meta-regression models to account for study-level covariates. We applied our models to estimate optimal doses of 21 different antidepressants.

We also built a suite of models that combine individual participant data and aggregate data to allow for the inclusion of randomized controlled trials or non-randomized studies. We implemented the models in a new R package – *crossnma* – now available on The Comprehensive R Archive Network, CRAN.

We also continue our work on combining prognosis research and evidence synthesis methods.

using machine learning or statistical methodology and present various applications of our models to make predictions about treatment effects in the fields of psychiatry, neurology, cardiology, and oncology.

Funded by the Wellcome Trust (UK), we received a new grant for The GALENOS Project – the Global Alliance for Living Evidence on aNxiety, depressiOn and pSychosis – allowing us to create and maintain a new living evidence resource of early phase research for research prioritization in mental health.

Key academic activities

Teaching: Members of the group teach postgraduate courses at the University of Bern. We also participate in and organize international short courses.

Conferences and Events: In August, we co-organized the “Expert workshop on risks of bias and reporting of prevalence studies in epidemiology” funded by the Swiss National Science Foundation program, Scientific Exchanges.

Scientific Talks and Presentations: The MHCOVID team presented the project at the NRP78 COVID-19 conference in May and at the Congress of the German Association for Psychiatry, Psychotherapy, and Psychosomatics in November. We also presented technical aspects of MHCOVID at Bern Data Science Day 2022 in May.

Group members presented “Personalized predictions under several treatment options: An online tool for patients with relapsing-remitting multiple sclerosis” at the European Multiple Sclerosis Platform annual conference in April and “Ranking treatments on multiple outcomes and trade-off between benefit and harms” and “Measuring the performance of prediction models to personalize treatment choice” at the 43rd Annual Conference of the International Society for Clinical Biostatistics in August.

Outreach and Representation: The MHCOVID team presented their project and contributed with activities for lay audience during the “Nacht der Forschung” at the University of Bern in August.

Grants

Funding for our work continued from the European Commission (Horizon 2020 for HTx project), the Swiss National Science Foundation (project funding; NRP78; Ambizione), and the UK’s Wellcome Trust.

Internal and external collaborations

Within the Institute of Social and Preventive Medicine, we collaborate with Sexual and Reproductive Health, Mental Health, and HIV, Hepatitis, and Tuberculosis research groups. We have numerous collaborators around the globe from many universities, such as University of Oxford and University of York, UK; University of Kyoto, Japan; University of Oulu, Finland and many more.

Key team members

Konstantina Chalkou (PhD candidate); Virginia Chiocchia (PhD candidate); Orestis Efthimiou (PD, senior researcher); Matthias Egger (head of HIV, hepatitis, and tuberculosis research group); Tasnim Hamza (PhD candidate); Alex Holloway (computer scientist); Georgia Salanti (head of research group); Michael Seo (PhD candidate); Thomy Tonia (senior researcher); Chiara Gastaldon (senior researcher).

Selected publications

Hamza T, Furukawa TA, Orsini N, Cipriani A, Iglesias CP, Salanti G. A dose-effect network meta-analysis model with application in antidepressants using restricted cubic splines. *Stat Methods Med Res.* 2022;9622802211070256.

Liu Q, **Salanti G**, De Crescenzo F, Ostinelli E, Li Z, Tomlinson A, Cipriani A, **Efthimiou O.** Development and validation of a meta-learner for combining statistical and machine learning prediction models in individuals with depression. *BMC Psychiatry.* 2022;22(1):337.

Salanti G, Peter N, **Tonia T, Holloway A**, White IR, Darwish L, **Low N, Egger M, Haas AD**, Fazel S, Kessler RC, Herrman H, Kieling C, De Quervain DJF, Vigod SN, Patel V, Li T, Cuijpers P, Cipriani A, Furukawa TA, and Leucht S, and MHCOVID Crowd Investigators. The Impact of the COVID-19 Pandemic and associated control measures on the mental health of the general population: A systematic review and dose-response meta-analysis. *Ann Intern Med.* 2022;175(11):1560–71.

Salanti G, Nikolakopoulou A, **Efthimiou O**, Mavridis D, **Egger M**, White IR. Introducing the treatment hierarchy question in network meta-analysis. *Am J Epidemiol.* 2022;191(5):930–38.

Seo M, Debray T, **Ruffieux Y**, Gsteiger S, Bujkiewicz S, Finckh A, **Egger M, Efthimiou O.** Combining individual patient data from randomized and non-randomized studies to predict real-world effectiveness of interventions. *Stat Methods Med Res.* 2022;31(7):1355–73.

HIV, Hepatitis and Tuberculosis

Our research group examines the clinical and public health epidemiology of HIV and coinfections, including hepatitis B/C and tuberculosis (TB), focusing on Southern Africa. We investigate antiretroviral therapy (ART) clinical outcomes and their impact on HIV transmission and coinfections. We conduct fieldwork, analyze large databases, develop mathematical models, and work on methodological issues.

Key scientific activities

In 2022, we contributed to more than 30 articles from the Southern African region of the International epidemiology Databases to Evaluate AIDS (IeDEA) and other papers focusing on COVID-19 in Switzerland and Europe. Several studies examined the impact of the COVID-19 pandemic on outcomes among people living with HIV (PLWH). Our analysis of Malawi's national HIV/AIDS program showed a significant decline monitoring HIV viral load during COVID-19, yet unclear evidence the pandemic led to reduced virologic suppression of HIV (PhD project Thokozani Kalua). A survey of ART clinics providing TB services in Africa and Asia-Pacific showed the COVID-19 pandemic led to staff shortages, reduced access to TB care, and delayed follow-up visits for people with TB in both regions [Master of Public Health (MPH) thesis Mariana Marti].

We contributed to an analysis of historical dimensions of the COVID-19 pandemic in 3 European countries with reliable mortality data from more than 100 years. The study found the COVID-19 pandemic in 2020 led to the second largest infection-related excess mortality increase in Spain, Sweden, and Switzerland since the beginning of the 20th century during the 1918 influenza pandemic when excess mortality was higher. Another analysis examined regional differences in excess mortality in 5 European countries. With around 30%, Madrid, Castile-La Mancha, and Castile-Léon in Spain and Lombardy in Italy were regions with highest excess mortality. London and the West Midlands in England, Macedonia in Greece, and Ticino in Switzerland were also heavily affected with 15–20% excess mortality in 2020.

We used clinical data and data on patient movements, cough frequency, carbon dioxide levels, humidity, and TB genomes in the air in a modeling study to estimate transmission risks for patients attending a primary care clinic in Cape Town, South Africa. Ranging between 9% and 29%, the transmission risk was high. We found a more significant number of young adults attending the clinic – and higher relative humidity – increased transmission risk.

To promote client-centered care and relieve strain on health facilities, Zimbabwe adopted differentiated HIV care policies in 2015. We examined the availability, experiences, and perceptions of differentiated ART delivery in rural Zimbabwe following the policy adoption. We found delivery models widely available, yet only a few clinics offered fast-track refills of antiretroviral drugs – even though patients often mentioned it as desirable. We identified confidentiality, travel expenses, and client waiting times as key considerations when rolling out differentiated HIV care.

Loss to follow-up continues to be a major issue in HIV treatment and care programs in sub-Saharan Africa. Our analysis of children and youth on ART lost to follow-up and traced in Southern Africa estimated a high mortality of almost 10%. The study shows the need for tracing children and youth lost to follow-up for resuming care and reporting program mortality accurately.

We contributed to several multi-regional analyses of IeDEA data, such as studies of growth and CD4 cell counts of adolescents living with perinatally acquired HIV, delayed diagnosis of HIV among older individuals, and outcomes of HIV-exposed infants.

Key academic activities

Students: Mariana Marti defended her MPH thesis.

Teaching: We contributed to undergraduate and postgraduate teaching, including problem-based learning, critical appraisal of studies, the epidemiology book club, biostatistics for medical students, advanced statistical methods for physicists, and courses for PhD and MPH students.

Conferences and Events: In November 2022, we met with IeDEA collaborators for our biannual Steering Group Meeting in Muldersdrift, South Africa – near the Cradle of Humankind. Over 50 epidemiologists, clinicians, and health scientists convened during the 3-day meeting to discuss ongoing research and celebrate past achievements. Much of the meeting was dedicated to early career researchers and colleagues from collaborating centers.



Group photo from the Steering Group meeting of the Southern African region of IeDEA near Johannesburg, South Africa.

Another focus of our group's work is capacity building and training within the IeDEA network. Three colleagues from Africa involved in the National Institutes of Health (NIH) Fogarty mentoring program attended the Swiss Epidemiology Winter School in Wengen in 2022 – finally in-person again after 2 years – to learn about the latest public health sciences methods.



Matthias Egger with Jabulani Ncayiyana, Benson M. Hamooya, and Billy Tsim – NIH Fogarty trainees from Southern Africa at the Winter School in Wengen.

Scientific Talks and Presentations: Yannick Turdo, Yann Ruffieux, Tebasto Boshomane, Hannes Mouton, Katayoun Taghavi, Andreas Haas, Gary Maartens, and Eliane Rohner presented an e-poster at AIDS 2022, “Cancer treatment and survival among cervical cancer patients living with or without HIV in South Africa.”

With colleagues, Yann Ruffieux presented the poster “Age and cancer incidence in 5.2 million people living with HIV in Southern Africa” at the International Conference on Malignancies in AIDS and Other Acquired Immunodeficiencies.”

At the International Workshop on HIV and Hepatitis Observational Databases conference,

Tom Loosli, Stefanie Hossman, Richard Lessels, Jonathan Sterne, Matthias Egger, and Roger Kouyouos presented “HIV-1 drug resistance in patients failing dolutegravir-based regimens: Collaborative analysis of HIV cohort studies.”

Mariana Marti, Kathrin Zürcher, Leslie A. Enane, Lameck Diero, Olivier Marcy, Thierry Tiendrebeogo, Marcel Yotebieng, Christelle Twizere, Suwimon Khusuwan, Evy Yunihas-tuti, Gary Reubenson, Matthias Egger, and Lukas Fenner on behalf of the leDEA consortium presented the poster “Impact of the COVID-19 pandemic on TB services at ART programs in low- and middle-income countries: a multi-cohort.”

Belinda Chihota, Gad Murenzi, Albert Minga, Sanjay Mundhe, Hugo Perazzo, Kara Wools-Kaloustian, Suzanne Goodrich, Mark Kuniholm, François Dabis, Thida Singtoroj, Brenda Crabtree Ramirez, Harriet Daultrey, Matthias Egger, and Gilles Wandeler on behalf of the leDEA consortium presented the poster “Diagnostic accuracy of HbA1c for diabetes among people living with HIV in low-and middle-income countries.”

At the Conference on Retroviruses and Opportunistic Infections,

Yann Ruffieux, Hannes Mouton, Andreas Haas, Matthias Egger, Gary Maartens, and Eliane Rohner presented the poster “Excess mortality associated with cancer in private HIV care program in South Africa.”

Yann Ruffieux, Mazvita Muchengeti, Victor Olago, Tafadzwa Dhokeotera, Julia Bohlius, Matthias Egger, Elvira Singh, and Eliane Rohner presented the poster “Age and cancer incidence in 5.2 million people living with HIV in South Africa.”

Yann Ruffieux, Mpho Tlali, Anja Wettstein, Gary Maartens, John A. Joska, Morna Cornell, Leigh Johnson, Nicola Maxwell, Veronika Skrivankova Whitesell, Mary-Ann Davies, Matthias Egger, and Andreas Haas presented the poster “Excess life-years lost associated with hospitalisation for mental illness.”

Anja Wettstein, Mpho Tlali, John A. Joska, Morna Cornell, Veronika Skrivankova Whitesell, Soraya Seedat, Johannes P. Mouton, Leigh L. van den Heuvel, Nicola Maxwell, Mary-Ann Davies, Gary Maartens, Matthias Egger, and Andreas Haas for leDEA Southern Africa presented the poster “Effects of the Covid-19 lockdown on mental health care use in people living with HIV.”

Veronika Skrivankova Whitesell, Stefanie Hossman, Carole Dupont, Morna Cornell, Marie Ballif, and Matthias Egger presented the poster, “Authorship inequalities in Global health research initiative.”

Jabulani Ncayiyana, Radoslaw Panczak, Per von Groote, and Matthias Egger presented the poster, “Fidelity of universal HIV test and treatment (UTT) implementation in South Africa.”

At the TB Union conference, Kathrin Zürcher, Keren Middelkoop, Julien Riou, Juane Leukes, Simon Bertschinger, Marie Ballif, Robin Wood, Matthias Egger, and Lukas Fenner presented “Comparing mycobacterium tuberculosis transmission risks pre-pandemic to COVID-19 pandemic conditions in a primary care clinic in a TB/HIV high burden setting.”

Outreach and Representation: As members of the Antimycobacterial Susceptibility Testing Group, we contributed to updated guidelines on susceptibility and resistance to anti-TB agents.

Honors and Awards: For her thesis “Tuberculosis among people living with and without HIV in lower-income countries: transmission, resistance, and mortality,” Kathrin Zürcher won the Graduate School for Cellular and Biomedical Sciences PhD student award.

Grants

National Institute of Allergy and Infectious Diseases (U01AI069924): International epidemiology Databases to Evaluate AIDS – Southern Africa (leDEA-SA), (USD 16 million; PI: Matthias Egger; 2021–2026).

National Institute of Allergy and Infectious Diseases (R01AI152772): HIV-1 subtype, specific drug resistance in patients failing Dolutegravir-based 1st, 2nd or 3rd line regimens: the International epidemiological Databases to Evaluate AIDS (leDEA), (USD 2.4 million; PI: Matthias Egger; 2021–2024).

Multidisciplinary Center for Infectious Diseases: Preparedness for surveillance in school rooms in pandemic and epidemic situations: multiple measure approach to estimate transmission and interventions for COVID-19 and seasonal influenza, (PI: Lukas Fenner).

Multidisciplinary Center for Infectious Diseases: Core activity BReady cohort, (PIs: Gilles Wandeler, Nicola Low).

Multidisciplinary Center for Infectious Diseases: Early detection for early action: integrating multiple data sources for monitoring the SARS-CoV-2 epidemic in near real-time, (Co-Applicant: Julien Riou).

Internal and external collaborations

In Switzerland, we work with colleagues at University of Zürich, ETH Zürich, the Swiss Tropical and Public Health Institute. Within the Institute of Social and Preventive Medicine, we collaborate with Cancer, Mental Health, Sexual and Reproductive Health, Interfaculty Platform for Data and Computational Science, and Evidence Synthesis research groups.

We collaborate with the Joint United Nations Program on HIV/AIDS and World Health Organization; the Centre for Infectious Disease Epidemiology and Research at the University of Cape Town, South Africa and many other collaborators within leDEA. Other collaborators are based at the University of Kwa-Zulu Natal in South Africa and the London School of Hygiene and Tropical Medicine and University of Bristol, UK.

Key team members

Nanina Anderegg (statistician); Marie Ballif (postdoc); Nicolas Banholzer (postdoc); Carole Dupont (scientific and administrative assistant); Orestis Efthimiou (research fellow); Matthias Egger (head of research group); Lukas Fenner (senior research scientist); Nathalie Fernandez (research fellow); Chiara Gastaldon (postdoc); Andreas Haas (head of mental health research group); Anthony Hauser (research fellow); Stefanie Hossmann (project manager); Rowan Iskandar (adjunct researcher); Cam Ha Dao Ostinelli (clinical data manager); Radoslaw Panczak (postdoc); Julien Riou (postdoc); Eliane Rohner (head of cancer research group); Yann Ruffieux (research associate); Tiana Schwab (PhD candidate); Lilian Smith-Wirth (project coordinator); Katayoun Taghavi (postdoc); Per von Groote (program manager); Gilles Wandeler (adjunct researcher); Anja Wettstein (PhD candidate); Veronika Skrivankova Whitesell (research fellow); Elizabeth Zaniewski (project manager and epidemiologist); Kathrin Zürcher (postdoc); Marcel Zwahlen (director a.i.).

Staub K, **Panczak R**, Matthes KL, Floris J, Berlin C, Junker C, Weitkunat R, Mamelund SE, **Zwahlen M, Riou J**. **Historically High Excess Mortality During the COVID-19 pandemic in Switzerland, Sweden, and Spain**. *Ann Intern Med*. 2022;175(4):523–32.

Selected publications

Christ B, van Dijk JH, Nyandoro TY, Reichmuth ML, Kunzekwenyika C, Chammartin F, **Egger M**, Wringe A, **Ballif M**. **International epidemiology Databases to Evaluate AIDS. Availability and experiences of differentiated antiretroviral therapy delivery at HIV care facilities in rural Zimbabwe: a mixed-method study**. *J Int AIDS Soc* 2022;25(8):e25944.

Kalua T, **Egger M**, Jahn A, Chimpany T, Kolola R, **Anderegg N**. **HIV suppression was maintained during the COVID-19 pandemic in Malawi: a program-level cohort study**. *J Clin Epidemiol*. 2022;150:116–25.

Konstantinou G, Cameletti M, Gómez-Rubio V, Gómez IL, Pirani M, Baio G, Larrarui A, **Riou J, Egger M**, Vineis P, Blangiardo M. **Regional excess mortality during the 2020 COVID-19 pandemic in 5 European countries**. *Nat Commun* 2022;77(11):1098–104.

Marti M, **Zürcher K**, Enane LA, Diero L, Marcy O, Tiendrebeogo T, Yotebieng M, Twizere C, Khusuwan S, Yuniastuti E, Reubenson G, Shah NS, **Egger M, Ballif M, Fenner L**, **leDEA global consortium**. **Impact of the COVID-19 pandemic on TB services at ART programmes in low- and middle-income countries: a multi-cohort survey**. *J Int AIDS Soc*. 2022;25(10):e26018.

Nyakato P, Christ B, Anderegg N, Muhairwe J, Jefferys L, van Dijk J, Vinikoor MJ, van Lettow M, Chimbete C, Phiri S, **Egger M, Ballif M**, Yiannoutsos CT, Schomaker M, Kassanje R, Davies, MA, Cornell M. **High unreported mortality in children and youth (<25 years) living with HIV who were lost to care from antiretroviral therapy programs in Southern Africa: results from a multi-country tracing study**. *J Acquir Immune Defic Syndr*. 2022;91(5):429–33.

INPUT – Interfaculty Platform for Data and Computational Science

The Interfaculty Platform for Data and Computational Science (INPUT) is a collaboration between the Institute of Social and Preventive Medicine (ISPM) and the Center for Space and Habitability (CSH). We foster interdisciplinary research at the interface of statistics, data science, and computational science with applications in epidemiology, medicine, and the natural sciences. We apply statistical and machine learning to large data sets and use high-performance computing for simulation-based inference. A major focus of our research is infectious disease modeling and outbreak analysis.

Key scientific activities

In 2022, we completed the CoMix study in Switzerland – a longitudinal social contact survey among representative panels of individuals in terms of age, gender, region of residence, and occupation. The groundbreaking CoMix study allowed study of social mixing patterns between different age groups during the COVID-19 pandemic in real-time. We also investigated socioeconomic characteristics associated with vaccination uptake and asked participants about their awareness, attitudes toward vaccination, and behaviors in response to COVID-19.

We started our Multidisciplinary Center for Infectious Diseases (MCID) project integrating multiple data sources for monitoring the SARS-CoV-2 epidemic in near real-time. After ethics protocol approval, we began analyzing hospital data from the University Hospital of Bern, Inselspital to determine indicators and early warning signals for predicting epidemic dynamics of SARS-CoV-2 and future pandemic threats. Furthermore, we developed improved methods to estimate time-dependent transmission rates of SARS-CoV-2 for advancing evidence-based policy making during the post-pandemic period.

Our collaborators in South Africa identified the new SARS-CoV-2 Omicron variant in late 2021. INPUT was part of a large international effort to describe Omicron's genomic profile and early transmission dynamics. Using a mathematical model, we described how Omicron's strong immune evasion led to its rapid spread – findings critical for informing the global public health response to Omicron waves in 2022.

Together with researchers from the KPM Center for Public Management, we wrote a position paper on behalf of the Federal Office of Public Health as input for the current revision of the Swiss Epidemics Act (EpidA). The existing EpidA in Switzerland defines a three-stage escalation model with normal, special, and extraordinary epidemic situations. We made 6 recommendations for further developing the escalation model. Considering our recommendations for revising EpidA ideally facilitates applying the escalation model, significantly improves its utility, and thus enables timely decision-making and early control of communicable diseases.

Key academic activities

Students: Martina L. Reichmuth successfully passed her mid-term evaluation at the Graduate School for Cellular and Biomedical Sciences and Martin Wohlfender started with his PhD project supported by MCID.

Teaching: Lectures on infectious disease epidemiology and modeling at bachelor and master levels at the University of Bern; course on infectious disease modeling at the Swiss Epidemiology Winter School in Wengen.

Conferences and Events: Emma B. Hodcroft was in the organizing committee of the 29th International Dynamics & Evolution of Human Viruses in San Diego, United States. Scientific Talks and Presentations: Invited talks at Collegium Generale, Bern Data Science Day, and the Symposium for Emerging Viral Diseases in Geneva, Switzerland; oral presentations at the 29th International Dynamics & Evolution of Human Viruses in San Diego, United States.

Outreach and Representation: Organized Twitter Spaces on mpox; pandemic game at Nacht der Forschung; talk at NZZ Standpunkte; advisory board of CH++; interviews in major national newspapers.

Honors and Awards: Emma B. Hodcroft won the 2022 Johanna Dürmüller-Bol Department for BioMedical Research Award for her project "The pandemic impact on circulation and diversity of a respiratory virus."

Grants

Horizon Europe and State Secretariat for Education, Research and Innovation (101095619): ESCAPE – Efficient and rapidly SCAlable EU-wide evidence-driven Pandemic response plans through dynamic Epidemic data assimilation. [CHF 400,257 (of total EUR 3,187,746) awarded to ISPM; Co-PI: Christian L. Althaus, Emma B. Hodcroft, Nicola Low; 01/2023–12/2026].

Horizon 2020 (101003688): EpiPose - Epidemic intelligence to minimize 2019-nCoV's public health, economic and social impact in Europe. [EUR 513,304 (of total 4,548,391) awarded to ISPM; Co-PI: Christian L. Althaus, Nicola Low; 03/2020–04/2023].

Swiss National Science Foundation (196046): Tracking the COVID-19 epidemic in Switzerland: phylogenetics and epidemiological modeling. (CHF 295,487; PI: Christian L. Althaus; 06/2020–10/2023).

Internal and external collaborations

INPUT continues as a collaboration between ISPM and CSH focusing on developing and applying computational methods in epidemiology, medicine, and the natural sciences. Within MCID, we collaborate with the Bern University Hospital (G. Beldi, A. Leichtle), the Institute for Infectious Diseases (A. Ramette), and the KPM Center for Public Management (C. Schlauffer, F. Sager). At ISPM, we collaborate with members of the following research groups: Climate Change and Health; HIV, Hepatitis, and Tuberculosis; Sexual and Reproductive Health; Community Health and Health Care Systems; and Health Services Research.

Internationally, we worked intensively with Nextstrain, our European partners from the EpiPose and ESCAPE projects, and the Centre for Epidemic Research, Response and Innovation in South Africa on investigating the spread of new SARS-CoV-2 variants and other COVID-19-related research.

Key team members

Christian L. Althaus (head of research group); Judith A. Bouman (postdoc); Simon L. Grimm (research fellow); Emma B. Hodcroft (postdoc); Martina L. Reichmuth (PhD candidate); Selina Wegmüller (project manager); Martin Wohlfender (PhD candidate).



Christian Althaus Judith Bouman Simon Grimm Emma Hodcroft Martina Reichmuth



Selina Wegmüller Martin Wohlfender

Selected publications

Althaus CL, Schlauffer C, Frahsa A, Hadorn S, Sager F, Zwahlen M. Prüfung des Eskalationsmodells (Art. 6 und 7 EpG) unter besonderer Berücksichtigung der Epidemiologie übertragbarer Krankheiten sowie Public-Health-Aspekten: Thesenpapier im Auftrag des Bundesamtes für Gesundheit (BAG) im Rahmen der Revision des Epidemiengesetzes (EpG). Bern: ISPM; 2022 8 Sep.

Estcourt CS, Stirrup O, Copas A, **Low N**, Mapp F, Saunders J, Mercer CH, Flowers P, Roberts T, Howarth AR, Owusu MW, Symonds M, Nandwani R, Ogwulu C, Brice S, Johnson AM, **Althaus CL**, Williams E, Comer-Schwartz A, Tostevin A, Cassell JA. Accelerated partner therapy contact tracing for people with chlamydia (LUSTRUM): a crossover cluster-randomised controlled trial. Lancet Public Health. 2022;7(10):e853–e65.

Hodcroft EB, Dyrdak R, Andrés C, Egli A, Reist J, García Martínez de Artola D, Alcoba-Flórez J, Niesters HGM, Antón A, Poelman R, Reynders M, Wollants E, Neher RA, Albert J. Evolution, geographic spreading, and demographic distribution of Enterovirus D68. PLoS Pathog. 2022;18(5):e1010515.

Reichmuth ML, Hodcroft EB, Riou J, Neher RA, Hens N, Althaus CL. Impact of cross-border-associated cases on the SARS-CoV-2 epidemic in Switzerland during summer 2020 and 2021. Epidemics. 2022;41:100654.

Viana R, Moyo S, Amoako DG, Tegally H, Scheepers C, **Althaus CL**, Anyaneji UJ, Bester PA, Boni MF, Chand M, Choga WT, Colquhoun R, Davids M, Deforche K, Doolabh D, du Plessis L, Engelbrecht S, Everatt J, Giandhari J, Giovanetti M, Hardie D, Hill V, Hsiao NY, Iranzadeh A, Ismail A, Joseph C, Joseph R, Koopile L, Kosakovsky Pond SL, Kraemer MUG, Kuate-Lere L, Laguda-Akingba O, Lesetedi-Mafoko O, Lessells RJ, Lockman S, Lucaci AG, Maharaj A, Mahlangu B, Maponga T, Mahlakwane K, Makatini Z, Marais G, Maruapula D, Masupu K, Matshaba M, Mayaphi S, Mbhele N, Mbulawa MB, Mendes A, Mlisana K, Mnguni A, Mohale T, Moir M, Moruisi K, Mosepele M, Motsatsi G, Motswaledi MS, Mphoyakgosi T, Msomi N, Mwangi PN, Naidoo Y, Ntuli N, Nyaga M, Olubayo L, Pillay S, Radibe B, Ramphal Y, Ramphal U, San JE, Scott L, Shapiro R, Singh L, Smith-Lawrence P, Stevens W, Strydom A, Subramoney K, Tebeila N, Tshiabuila D, Tsui J, van Wyk S, Weaver S, Wibmer CK, Wilkinson E, Wolter N, Zarebski AE, Zuze B, Goedhals D, Preiser W, Treurnicht F, Venter M, Williamson C, Pybus OG, Bhiman J, Glass A, Martin DP, Rambaut A, Gaseitsiwe S, von Gottberg A, de Oliveira T. Rapid epidemic expansion of the SARS-CoV-2 Omicron variant in southern Africa. Nature. 2022;603(7902):679–86.

Social contacts per day as reported in the CoMix survey in Switzerland. Numbers represent the average numbers of social contacts per day.



Lifestyle and Behaviour

By taking a transdisciplinary and life-course approach, the Lifestyle and Behaviour group aims to understand complex associations between modifiable lifestyle factors and major non-communicable diseases in the context of healthy aging. The main research streams over the past year focused on identifying (i) potential causal pathways underlying lifestyle-related chronic diseases and (ii) the role of lifestyle in rehabilitation and health maintenance after neurotrauma.

Key scientific activities

We published important papers discussing the role of physical activity and nutrition preventing cardiovascular disease. We performed a meta-analysis including more than 30,000 individuals showing the importance of preserving or adopting active lifestyles among individuals with coronary heart disease. In another paper focused on benefits of physical activity and exercise among people with spinal cord injury (SCI), we emphasized changing the current "exercise as much as possible as long as possible according to your abilities to remain healthy" paradigm with updated evidence-based exercise guidelines for the prevention and management of cardiovascular diseases, post-injury.

We also successfully completed a pilot trial exploring the feasibility of probiotic and prebiotic interventions among elite para-athletes with SCI and established a basis for promoting a microbiome research agenda beyond gastrointestinal health. Through a large collaborative effort, we published the most comprehensive overview and analysis of the theoretical models of healthy aging and its associated normative terms and definitions to-date.

Our group collaborated with Swiss Paraplegic Research in Nottwil by leading development of the SCI NutriTool – a short, multilingual paper and online instrument for evaluating diet quality among individuals with SCI. Importantly, the project quickly screens and identifies people with SCI who avoid healthy diet recommendations. Available for use in everyday clinical practice or time-sensitive settings, a paper version of the tool quickly identifies people needing further nutrition counseling for improved diet. Accessible globally and digitally, the online version allows people with SCI anywhere to use it. A web platform also provides nutrition education and promotes healthy lifestyles for vulnerable populations, globally.

Key academic activities

Students: 3 PhD candidates successfully completed their PhD studies: Giorgia Grisotto, Zayne Milena Roa Díaz, and Nathalia González.

Oche Adam Itodo interned at UNESCO CHAIR for sexual health and human rights in Paris, France. He managed and produced massively open online courses on Rights, Sex, and Education with the aim of sensitizing French and international communities to sexual health prevention strategies, accessing sexual health services, and developing sexual rights awareness within the context of public health prevention.

Since Magda Gamba won first place in 2021 SSPH+ ScienceFlashTalk contest, she represented the Institute of Social and Preventive Medicine and the University of Bern during Health Week in 2022 at the Dubai Expo 2020. Marilyne Menassa was a visiting researcher at Amsterdam University Medical Center in the Department of Public and Occupational Health for the Healthy Life; she also interned at the Rijksinstituut voor Volksgezondheid en Milieu in The Netherlands, working on lifestyle and healthy aging.

Teaching: Marija Glisic led postgraduate courses on evidence-based public health and systematic review and meta-analysis within the Master of Public Health program at the Universities of Bern, Basel, and Zürich.

At the University of Bern, Glisic also teaches in the 24 steps to systematic review and meta-analysis training school; undergraduate epidemiology for Chemistry and Biochemistry; and clinical epidemiology and health technology assessment in the Biomedical Engineering program.

Glisic teaches in the certificate of advance study program in Sex- and Gender-Specific Medicine at the University of Zürich. Together with Jivko Stoyanov, Marija Glisic teaches translational medicine at the University of Lucerne.

Glisic was also a trainer in Harmony – a Cooperation in Science & Technology (COST) action focused on novel tools for test evaluation and disease prevalence estimation – and in the Bayesian latent class models–meta-analysis: an introduction at the University of Novi Sad, Serbia.

Scientific Talks and Presentations: Over the past year, we presented our work at the 5th International Symposium on Phytochemicals in Medicine; the International Spinal Cord Society annual meeting; the European Society of Cardiology annual meeting; and the annual meeting of European Society of Endocrinology.

Outreach and Representation: Marija Glisic is a member of ANDRONET – the European andrology network for research coordination, education, and public awareness – a European COST action. Marija Glisic and Jivko Stoyanov are members of the Swiss SCI Cohort consortia's biomedical interest group, as well as the Swiss BioRef for personalized reference values for precision medicine. Marilyne Menassa is a member of the 2022 cohort for the Association of Schools of Public Health in the European Region Young Professional Program.

Grants

Leading House for the Latin American Region, Switzerland: Predictive value of novel circulating biomarkers in Chagas disease: the Brazilian Chagas disease cohort. (CHF 23,670; PI: Marija Glisic; 07/2021–07/2022).

Internal and external collaborations

Our group collaborates with a broad national and international multidisciplinary network of researchers, clinicians, and other professionals in the field of cardiometabolic diseases, lifestyle, and SCI.

Key team members

Zayne Milena Roa Díaz (PhD candidate); Magda Gamba (PhD candidate); Marija Glisic (head of research group); Nathalia González (PhD candidate); Giorgia Grisotto (PhD candidate); Oche Adam Itodo (PhD candidate); Marilyne Menassa (PhD candidate); Cristina Mesa-Vieira (PhD candidate); Jivko Stoyanov (titular professor); Leonidas G Karagounis (adjunct professor).

Selected publications

Glisic M, Flueck JL, Ruettimann B, Hertig-Godeschalk A, Valido E, Bertolo A, Stucki G, **Stoyanov J**. [The feasibility of a crossover, randomized controlled trial design to assess the effect of probiotics and prebiotics on health of elite Swiss para-athletes: a study protocol](#). *Pilot Feasibility Stud.* 2022;8(1):94.

Itodo OA, Flueck JL, **Raguindin PF**, Stojic S, Brach M, Perret C, **Minder B**, **Franco OH**, **Muka T**, Stucki G, **Stoyanov J**, **Glisic M**. [Physical activity and cardiometabolic risk factors in individuals with spinal cord injury: a systematic review and meta-analysis](#). *Eur J Epidemiol.* 2022;37(4):335–65.

Raguindin PF, Cardona I, **Muka T**, Lambrinouadaki I, Gebhard C, **Franco OH**, Marques-Vidal P, **Glisic M**. [Does reproductive stage impact cardiovascular disease risk factors? Results from a population-based cohort in Lausanne \(CoLaus study\)](#). *Clin Endocrinol (Oxf).* 2022;97(5):568–80.

Raguindin PF, **Stoyanov J**, Eriks-Hoogland I, Stucki G, Jordan X, Schubert M, **Franco OH**, **Muka T**, **Glisic M**; [Swiss Spinal Cord Injury \(SwiSCI\) Study Group](#). [Cardiometabolic risk profiling during spinal cord injury rehabilitation: A longitudinal analysis from the Swiss Spinal Cord Injury \(SwiSCI\) cohort](#). *PM R.* 2022.

Mental Health

The Mental Health research group focuses on 4 main areas of study:

1) the epidemiology of mental illness; 2) the relationship between mental and physical health conditions; 3) the provision of mental health services; and 4) the influence of mental illness on the treatment of physical comorbidities.

Key scientific activities

People with mental illness experience reduced life expectancy. In South Africa, the magnitude of the mortality gap and contribution of natural and unnatural causes of death to excess mortality among those with mental health issues remain unknown.

In a cohort study of over 1 million beneficiaries of a large South African medical insurance scheme, we found life expectancy reduced by 3.8 years for men and 2.2 years for women with mental health diagnoses. We found most life-years lost attributable to natural causes. Among people with bipolar or substance use disorder, a considerable number of life-years lost were attributable to unnatural causes.

In further cohort studies, we investigated the causal pathways leading to excess mortality among persons with mental illness. For example, we showed among people with post-traumatic stress disorder, incidence of major cardiovascular events was approximately 20% higher when compared with persons without mental health complications.

Additionally, we performed a causal mediation analysis to break down the average total effect of major depression on mortality into indirect effects through physical comorbidities. We found the higher incidence of HIV, tuberculosis, cardiovascular disease, chronic respiratory disease, chronic kidney disease and cancer among persons with depression – when compared with those without – accounted for almost 50% of the excess mortality observed in persons with depression. In further cohort studies, we examined associations between mental illness and adverse HIV treatment outcomes, the management of opioid use disorder, and post-partum depression in South Africa.

Key academic activities

Students: Raphael Lienhard completed his MD thesis. Raphael studied adherence to antiretroviral therapy and viral suppression among adolescents and adults living with HIV and mental health complications in South Africa. Cristina Mesa-Vieira is in the final year of her PhD studies. Cristina investigates psychosocial risk factors of cardiovascular disease.

Teaching: Teaching medical students at the University of Bern.

Grants

National Institute of Allergy and Infectious Diseases (U01AI069924): International epidemiology Databases to Evaluate AIDS – Southern Africa (IeDEA-SA), (USD 16 million; PI: Mattias Egger; 2021–2026).

Swiss National Science Foundation (193381): Pathways from mental disorders to the burden of disease: Causal mediation analysis of big data from South Africa, (CHF 924,952; PI: Andreas Haas; 2021–2025).

Internal and external collaborations

We collaborate with several Institute of Social and Preventive Medicine research groups: HIV, Hepatitis, and Tuberculosis; Cancer; and Evidence Synthesis Methods.

In South Africa, we also collaborate with the Centre for Infectious Disease Epidemiology and Research and the HIV Mental Health Research Unit, University of Cape Town; Department of Psychiatry, University of Stellenbosch; and Western Cape Provincial Department of Health; in the USA, we collaborate with the Department of Psychiatry and New York State Psychiatric Institute, Columbia University.

Key team members

Christiane Didden (statistician); Chiara Gastaldon (postdoctoral researcher); Andreas Haas (head of research group); Raphael Lienhard (MD student); Yann Ruffieux (statistician); Veronika Skrivankova Whitesell (research fellow); Cristina Mesa-Vieira (PhD candidate).

Selected publications

Mesa-Vieira C, Haas AD, Buitrago-García D, Roa Díaz ZM, Minder B, Gamba M, Salvador D, Gómez D, Lewis M, González-Jaramillo WC, Pahud De Mortanges A, Buttia C, Muka T, Trujillo N, Franco OH. Mental health of migrants with pre-migration exposure to armed conflict: A systematic review and meta-analysis. *Lancet Public Health.* 2022;7(5):e469–e81

Tlali M, Scheibe A, **Ruffieux Y**, Cornell M, **Wettstein AE, Egger M**, Davies M, Maartens G, Johnson LF, **Haas AD. Diagnosis and treatment of opioid use disorder in a South African private sector medical insurance scheme: A cohort study.** *Int J Drug Policy.* 2022;109:103853.

Wettstein A, Tlali M, Joska JA, Cornell M, **Skrivankova VW**, Seedat S, Mouton JP, van den Heuvel LL, Maxwell N, Davies MA, Maartens G, **Egger M, Haas AD. The effect of the COVID-19 lockdown on mental health care use in South Africa: An interrupted time-series analysis.** *Epidemiol Psychiatr Sci.* 2022;31:e43

Musculoskeletal Health and Rheumatology

The Musculoskeletal Health and Rheumatology research group is involved in research projects on musculoskeletal disorders, especially osteoarthritis, giant cell arteritis, and osteoporosis. Our research includes studies on prevalence, incidence, diagnosis, and natural history, as well as systematic reviews and randomized controlled trials (RCT). We collaborate with the Clinic for Rheumatology and Immunology at the University Hospital of Bern, Inselspital.

Key scientific activities

We established a new collaboration with the Institute for Biomechanics at ETH Zürich. Our goal includes establishing new biomechanical treatment options for knee osteoarthritis by influencing the knee load with personalized orthotic footwear.

We consolidated our collaboration with the primary and secondary health care system-based registry on osteoporosis and giant cell arteritis. In addition, we now host the new cohort on Takayasu arteritis – a Swiss registry.

We continue to analyze and publish results from the 10-year follow-up of the inception cohort study (Sumiswald cohort) to understand the role of femoroacetabular impingement in the development of osteoarthritis of the hip; we also continue to publish secondary analysis from the multi-center RCT comparing arthroscopic hip surgery to physiotherapy-led care for femoroacetabular impingement (Australian FASHIoN trial). We are analyzing long-term follow-up results on the rapid induction of remission with high-dose glucocorticoids among patients with giant cell arteritis (GUSTO trial).

Key academic activities

Students: 2 students received Medical Doctor degrees and 2 students finished their master theses.

Teaching: Regular teaching activities at the undergraduate and postgraduate levels, including seminars and talks.

Conferences and Events: Group members are invited regularly to national and international conferences for talks and presentations.

Scientific Talks and Presentations: Group members presented posters and talks at the 2 large Rheumatology conferences: the European League Against Rheumatism and the American College of Rheumatology.

Outreach and Representation: Stephan Reichenbach is board member for the Foundation of Physical Therapy Science, Switzerland.

Grants

Innosuisse – Swiss Innovation Agency (104.374 IP-LS): Personalized orthotic footwear for relieving knee pain and retarding progression of knee osteoarthritis through balancing dynamic knee loading (CHF 77,066 [of total 737,240] awarded to ISPM; PI: Stephan Reichenbach; 12/2022–12/2025).

Internal and external collaborations

Within Switzerland, we collaborate with University Hospital of Bern, Inselspital; Swiss Institute for Translational and Entrepreneurial Medicine (sitem-insel); University of Bern, CTU; OsteoRheuma Bern (Dr. Judith Everts-Graber); and ETH Zürich (Prof. Bill Taylor).

Outside of Switzerland, we collaborate with the University of Sydney, Australia (Prof. David Hunter); Boston University, USA (Prof. David Felson); and Rotterdam University, The Netherlands (Prof. Fernando Rivadeneira).

Key team members

Zina Heg-Bachar (data manager); Christian Bangerter (research assistant); Roger Hilfiker (PhD candidate); Stephan Reichenbach (head of research group).

Selected publications

Everts-Graber J, Bonel H, Lehmann D, Gahl B, Häuselmann H, Studer U, Ziswiler HR, **Reichenbach S**, Lehmann T. **Incidence of atypical femoral fractures in patients on osteoporosis therapy—a registry-based cohort study.** JBMR Plus. 2022;6(10):e10681.

Everts-Graber J, Lehmann D, Burkard JP, Schaller B, Gahl B, Häuselmann H, Studer U, Ziswiler HR, **Reichenbach S**, Lehmann T. **Risk of osteonecrosis of the jaw under denosumab compared with bisphosphonates in patients with osteoporosis.** J Bone Miner Res. 2022;37(2):340–48.

Everts-Graber J, **Reichenbach S**, Gahl B, Häuselmann H, Ziswiler HR, Studer U, Lehmann T. **Effects of zoledronate on bone mineral density and bone turnover after long-term denosumab therapy: Observations in a real-world setting.** Bone. 2022;163:116498.

Hilfiker R, Hunkeler M, Limacher A, Leunig M, Bonel H, **Egger M**, Jüni P, **Reichenbach S**. **Is internal rotation measurement of the hip useful for ruling in cam or pincer morphology in asymptomatic males? A diagnostic accuracy study.** Clin Orthop Relat Res. 2022;480(10):1989–98.

Reichenbach S, Jüni P, Hincapié CA, Schneider C, Meli DN, Schürch R, Streit S, Lucas C, Mebes C, Rutjes AWS, da Costa BR. **Effect of transcutaneous electrical nerve stimulation (TENS) on knee pain and physical function in patients with symptomatic knee osteoarthritis: the ERELKA randomized clinical trial.** Osteoarthritis Cartilage. 2022;30(3):426–35.

Palliative Care and End of Life

The Palliative Care and End of Life research group explores topics such as clinician wellbeing and emotions, communication, community care, and cost analyses. Through a double affiliation with the Institute of Social and Preventive Medicine (ISPM) and the University Centre for Palliative Care (Centre) at University Hospital of Bern, Inselspital, our interdisciplinary group combines clinical and methodological expertise in qualitative and quantitative methodologies to undertake clinical, psychosocial, and health services research.

Key scientific activities

Our key research activities focused on 1) advancing the definition of a core outcome set for the care of dying people; 2) evaluating telemedicine in palliative care; 3) developing and testing a communication model for medical students about approaching death; 4) developing an advance care planning course with and for older adults and caregivers; 5) evaluating and establishing societal model procedures for proactive planning for the end-of-life; and 6) consolidating Eccellenza projects on physician emotions and communication.

Key academic activities

Teaching: We continue to teach all lectures and seminars on palliative medicine for medical students in years 4–6, covering areas such as symptom assessment and management, as well as psychosocial aspects, such as grief, communication about dying and death, and ethical aspects including euthanasia in older age and self-determination.

For the first time, we also conducted communication training for assistant physicians (internal medicine) on the topic of “talking about dying.” Since 2017, our Centre is responsible for the postgraduate certificate of advanced studies in Interprofessional Specialized Palliative Care at the University of Bern.

Furthermore, through our research we are developing and evaluating innovative teaching models for medical students, healthcare professionals, and the general Swiss population.

Conferences and Events: We organized the National Research Day Palliative care (August); the Jubiläumsanlass 10 Jahre Palliativzentrum (February); the book presentation *Das Lebensende und ich* (June); and a public event about “stories around the end-of-life” (June).

We co-organized the 7th International Public Health Palliative Care Conference (September); the yearly Compassionate City Bern event (November); and the pop-up exhibit, “dying at home” (November).

Scientific Talks and Presentations: Sofia Zambrano was invited keynote speaker at the National Research Day Palliative Care (August) and Sibylle Felber and Steffen Eychmüller at the 15th Palliative Medicine Forum in Berlin, Germany (November).

We also gave oral presentations at the International Conference on Communication in Healthcare (September); the Public Health Palliative Care International Conference (September); Internationale Sylter Palliativtage (March); Swiss Oncology and Hematology Congress (November); and 19 other professional talks and 5 poster presentations at medical or scientific events.

Outreach and Representation: Together with “Bärn treit,” we performed a variety of outreach activities to increase public knowledge and awareness of end-of-life and health care challenges, including an annual palliative care movie festival in Bern; book readings on dying; death cafés; and other open activities.

Bärn treit aims for sustainable development of Bern as a compassionate city. Compassionate City Bern is a community palliative care network that disseminates evidence-based knowledge to the public. In 2022, we were elected as the host city for the 8th Public Health International Palliative Care Conference (October 22–25, 2024).

Sibylle Felber was elected as national representative for the International Association for Communication in Healthcare.

Honors and Awards: Sibylle Felber and Steffen Eychmüller won the Gesellschaft für Medizinische Ausbildung e.V.(GMA)-Preis für innovative Lehrprojektideen 2022 for the “Compassion Training – through self-exposure towards more understanding for patients.”

Marina Maier was nominated for best abstract with “Sense of security with specialized palliative homecare: Experiences from multiple perspectives” at the National Research Day Palliative Care in Bern in August.

Grants

Swiss Academy of Medical Sciences (KZS 15/22): The sources and impact of moral distress on Swiss junior physicians: A mixed-methods study to develop a framework to foster resilience, ethical competence, and wellness in junior physicians. (CHF 95,994, PI: Sofia Zambrano; 04/2023–10/2024).

Swiss National Science Foundation (PCEFP1-194177): Eccellenza Professorial Fellowship: The risks and benefits of integrating emotions in end-of-life communication. (CHF 1,826,322; PI: Sofia Zambrano; 11/2021–11/2026).

Lindenhof Foundation, Bern: Plattform Palliative Care (CHF 1.48 million; PI: Steffen Eychmüller; 09/2020–08/2023).

Horizon 2020 (825731): iLIVE: Living well, dying well. A research programme to support living until the end. (Work Package Lead: Steffen Eychmüller; Sofia Zambrano) (EUR 394,750 [of 4,017,817] awarded to University of Bern; 01/2019–01/2023).

Swiss National Science Foundation (407440_167501): PROAKTIV: A cluster trial of palliative needs assessment and care in general practice. (CHF 559,431; PI: Steffen Eychmüller; Maud Maessen; 02/2018–07/2022).

Swiss National Science Foundation (33IC30_207041): DigiPALL; a randomized controlled trial of digital patient-reported outcomes and biomarker monitoring in palliative care. (CHF 704,038; Co-PI Steffen Eychmüller; 08/2022–08/2026).

Swiss National Science Foundation (10531G_212822): Cost data of patients dying in the hospital: does Palliative Care matter? - A retrospective cross-sectional study of complete hospital costs of deceased patients in a Swiss university hospital over 5 years. (CHF 149,011; PI: Maud Maessen; Co-PI: Steffen Eychmüller; Luca Emmenegger, Monika Hagemann, 12/2022–12/2024).

Swiss Cancer Research foundation: Communication with cancer patients and their families about approaching death: Scaffolding conceptual and practical learning for health professionals. (CHF 374,964; PI: Sissel Guttormsen; Co-Applicants: Steffen Eychmüller and Sofia Zambrano; 04/2019–04/2022).

Gesundheitsförderung Schweiz: Projekt «Co-Lab» Compassionate city. (CHF 125,000 [of total 300,000] awarded to University of Bern; PI: Claudia Michel; Steffen Eychmüller; 1/2020–12/2022).

St.Gallen Latin America House: Compassionate communities in Colombia, Argentina, and Switzerland. How to assess their effectiveness? (CHF 23,000; PI: Steffen Eychmüller; Co-Applicants: Valentina González, Andri Christen, and Sofia Zambrano; 01/2022–01/2024).

Internal and external collaborations

We conduct research in collaboration with an extensive network of local, regional, national, and international partners from a diverse range of areas and sectors. As an example, the iLIVE consortium is composed of 14 health and research institutions from 13 countries, including 11 European countries, Australia, New Zealand, and Argentina.

Within the Eccellenza, we collaborate internally with Berner Institute für Hausarztmedizin (BIHAM) and Institut für Medizinische Lehre (IML) at the University of Bern. In Switzerland, we collaborate with Zürich University Hospital and University of Fribourg. Outside of Switzerland, we collaborate with Vrije Universiteit Brussel, Belgium; Duke University, USA; Stanford University, USA; and University of Rochester, USA.

Key team members

Barbara Affolter (research collaborator); Jelena Baumann (research assistant); Andri Christen (research coordinator); Andreas Ebnetter (research collaborator); Martina Egloff (research assistant); Steffen Eychmüller (adjunct professor); Luca Emmenegger (research collaborator); Sibylle Felber (research collaborator); Monica Fliedner (postdoc); Monika Hagemann (research collaborator); Valentina González (postdoc); Anna Lange (PhD candidate); Maud Maessen (senior postdoc); Marina Maier (research assistant); Katrien Moens (PhD candidate); Maya Monteverde (research collaborator); Robert Staeck (PhD candidate); Cornelia Stähli (research assistant); Sofia Zambrano (head of research group).

Selected publications

Ebnetter AS, Sauter TC, Christen A, **Eychmueller S**. **Feasibility, acceptability and needs in telemedicine for palliative care: A pre-implementation scoping review**. Swiss Med Wkly. 2022;152:w30148.

Eychmüller S, **Felber S**. **Das Lebensende und ich**. 2022 Staempfli verlag, Bern.

González-Jaramillo V, **Maessen M**, Luethi N, Guyer J, Hunziker L, **Eychmüller S**, **Zambrano SC**. **Unmet Needs in Patients With Heart Failure: The Importance of palliative care in a heart failure clinic**. Frontiers Cardiovasc Med. 2022;9:866794.

Luethi N, Wermelinger SD, Haynes AG, Roumet M, **Maessen M**, **Affolter B**, Müller M, Schefold JC, **Eychmueller S**, Cioccaric L. **Development of an electronic poor outcome screening (ePOS) score to identify critically ill patients with potential palliative care needs**. J Crit Care. 2022;69:154007.

White N, Oostendorp LJ, Vickerstaff V, Gerlach C, Engels Y, **Maessen M**, Tomlinson C, Wens J, Leysen B, Biasco G, **Zambrano S**, **Eychmüller S**, Avgerinou C, Chattat R, Ottoboni G, Veldhoven C, Stone P. **An online international comparison of palliative care identification in primary care using the Surprise Question**. Palliat Med. 2022;36(1):142–51.

Yildiz, B, Allan, S, Bakan, M., Barnestein-Fonseca, P, Berger, M, Boughey, M, Christen, A, De Simone, GG, **Egloff, M**, Ellershaw, J, Elsten, EECM, **Eychmüller, S**, Fischer, C, Fürst, CJ, Geijteman, ECT, Goldraij, G, Goossensen, A, Halfdanardottir, SI, Haugen, DF,... **Zambrano, SC** and van der Heide, A. (2022). **Live well, die well – an international cohort study on experiences, concerns and preferences of patients in the last phase of life: the research protocol of the iLIVE study**. BMJ Open. 2022;12:e057229.

Public Health and Primary Care Library

The Public Health and Primary Care Library team provides services primarily for researchers and PhD students at the Institute of Social and Preventive Medicine (ISPM), CTU Bern, and the Institute of Primary Health Care (BIHAM). As embedded librarians, we offer tailored and immediate research support and work closely with research teams on their projects.

Our main expertise lies in creating comprehensive literature searches for all kinds of evidence synthesis research, providing support during the publishing process of research findings, monitoring ISPM, CTU, and BIHAM research output and open access compliance, and teaching systematic literature searching for Master of Public Health (MPH) and PhD students.

Key scientific activities

Following the Cochrane Handbook for Systematic Reviews, we create high-quality, state-of-the-art search strategies for information resources to ensure the accuracy and completeness of evidence used for literature reviews. As co-authors on several resulting papers, we take responsibility for correctly reporting the search process according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses – or PRISMA – guideline. Additionally, to ensure international quality standards, we offer peer-review for search strategies built by the researchers themselves. We perform our peer-review following the Peer-Review of Electronic Search Strategies – or PRESS 2015 – guideline.

In our role as expert searchers on systematic review teams, we strive to unburden the systematic review process from time-intensive, repetitive tasks, such as removing duplicate records from searching databases with overlapping content. Therefore, we initiated the development of a fully-automated deduplication tool, Deduklick. It is based on an artificial intelligence algorithm created by Risklick – a University of Bern spin-off.

Our joint efforts resulted in the publication of a peer-reviewed article, a conference presentation, workshops, and rising interest from researchers and information specialists all over the world. Together with the Risklick team, we continually work on improving the functionalities and creating new features to save valuable time for researchers, as well as information specialists, during the systematic review process, while also ensuring reliable performance.

Key academic activities

Teaching: We taught systematic literature search methods in modules of the MPH program, as well as the Swiss Schools of Public Health (SSPH+) PhD program. We built a curated, constantly updated collection of (self-)learning materials for conducting systematic literature searches in medical and health sciences on ILIAS – the central teaching and learning platform of the University of Bern. It is publicly accessible and intended to serve students, course participants, and other interested people.

Conferences and Events: We participated in the European Association for Health Information and Libraries (EAHIL) annual conference in Rotterdam, The Netherlands – the main European platform for meeting other expert searchers and medical information specialists. Throughout the year, we enlarged and updated our professional knowledge and skills by attending online webinars and workshops.

Scientific Talks and Presentations: Together with Nikolay Borissov – Risklick team member and Deduklick developer – we presented our new deduplication tool at the EAHIL annual conference. We highlighted Deduklick's features from the user perspective, while Nikolay

Borissov explained the technical side and performance. Our new tool attracted much interest from people working with big collections of records from around the world.

Internal and external collaborations

At the University of Bern, we collaborate with the Research Support Services team at the Medical Library (Systematic Review Services); the Open Science/Open Access team (Publishing Support); and the Risklick team (Deduklick).

We are in close contact with other expert searchers in the medical field, exchanging knowledge and ideas at international meetings organized by EAHIL and Arbeitsgemeinschaft für medizinisches Bibliothekswesen – AGMB – and via specialized mailing lists and book clubs.

Key team members

Doris Kopp-Heim (medical information specialist); Beatrice Minder (medical information specialist).

Selected publications

Borissov N, Haas Q, **Minder B, Kopp-Heim D**, von Gernler M, Janka H, Teodoro D, Amini P. **Reducing systematic review burden using Deduklick: a novel, automated, reliable, and explainable deduplication algorithm to foster medical research.** Syst Rev. 2022;11(1):172.

González-Jaramillo N, Wilhelm M, Arango-Rivas AM, **González-Jaramillo V, Mesa-Vieira C, Minder B, Franco OH, Bano A.** **Systematic review of physical activity trajectories and mortality in patients with coronary artery disease.** J Am Coll Cardiol. 2022;79(17):1690–700.

Mesa-Vieira C, Haas AD, Buitrago-García D, Roa Diaz ZM, Minder B, Gamba M, Salvador D, Jr., Gómez D, Lewis M, González-Jaramillo WC, Pahud de Mortanges A, Buttia C, **Muka T**, Trujillo N, **Franco OH.** **Mental health of migrants with pre-migration exposure to armed conflict: a systematic review and meta-analysis.** Lancet Public Health. 2022;7(5):e469–e81.

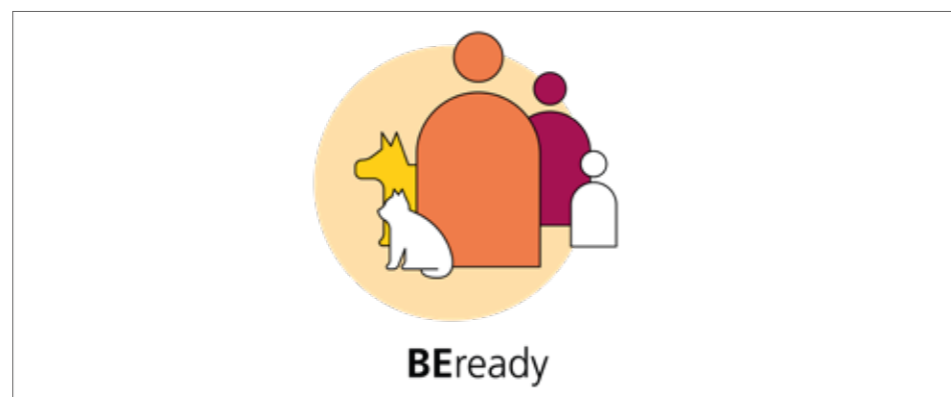
Sexual and Reproductive Health

We examine questions about etiology, epidemiology, prevention and control, diagnosis, and social and cultural aspects of sexually transmitted infections (STI) and emerging infectious disease threats in Switzerland and internationally. With commitments to living evidence and open science, our studies include field epidemiology, synthesis of published evidence, and methodological research. In 2022, 2 pandemics dominated the agenda and activities of the Sexual and Reproductive Health research group – severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and mpox (formerly known as human monkeypox).

Key scientific activities

To support researchers internationally, our research on SARS-CoV-2 maintained the coronavirus disease 2019 (COVID-19) Open Access Project database of living evidence through March 1, 2022; it contains more than 314,000 publications. Our updated living systematic review of the occurrence and transmission potential of asymptomatic SARS-CoV-2 infection found most infections did not remain asymptomatic and people with asymptomatic infections were less infectious than those with symptomatic infections. We started a new update on asymptomatic infections caused by SARS-CoV-2 variants of concern and contributed to the Mental Health in COVID project – led by the Evidence Synthesis research group. Our epidemiological and phylogenomic investigation of a large SARS-CoV-2 outbreak in Wengen, Switzerland (2020–2021) revealed several separate introductions of the alpha variant of concern as well as non-variant of concern infections (MD project Christian Kosok).

We started work to establish the “Bern, get ready” (BEready) cohort – a future resource for Multidisciplinary Center for Infectious Diseases (MCID) members to investigate infectious diseases and enhance pandemic preparedness in Switzerland. We invited 15,000 residents in the Canton of Bern to answer an online survey about the willingness of themselves and their household members (including pets) to take part in BEready.



We continue to investigate the impact of STI during pregnancy through primary research studies and systematic reviews, such as the Women and Newborn Trial of Antenatal Intervention and Management (WANTAIM, meaning “together”) in Papua New Guinea and a cohort study (Philani Ndiphile, meaning “be healthy, and I will be healthy”) in South Africa (MD-PhD project, Ranjana Gigi).



Our completed systematic review series of the etiological role of STI and genital mycoplasmas in adverse pregnancy outcomes shows potential associations with preterm birth, yet a need to improve the certainty of evidence with larger studies that control for confounding. We completed our research on accelerated partner therapy for contact tracing of chlamydia infections (with Christian L. Althaus and the UK-led Limiting Undetected Sexually Transmitted Infections to Reduce Morbidity program).

Key academic activities

Students: Our group included 3 PhD students and 1 MD student.

Teaching: Our group contributed to teaching for undergraduates in medicine and biomedical sciences and PhD students and postgraduates studying for certificates of advanced studies. Teaching subject areas include writing for publication and protocol development, gender studies, infectious disease epidemiology, public health ethics, and global health.

Conferences and Events: We conducted a workshop on reporting prevalence studies and evaluating their risk of bias as part of Diana Buitrago-García's PhD project (August 2022).



We conducted an international interdisciplinary meeting to discuss our policy analysis findings and burden of disease estimation qualitative research about the global political prioritization of STI.

Scientific Talks and Presentations: Invited keynote speaking and presentations at International Union against STI World Congress; presentations at the Society for Research Synthesis Methods and Papua New Guinea Medical Symposium.

Outreach and Representation: Nicola Low was co-chair of the public health expert group of the Swiss COVID-19 Science Task Force (until March 2022) and vice-chair of the International Health Regulations emergency committee on the multi-country outbreak of mpox.

For MCID, we contributed to science communication events on the SARS-CoV-2 Omicron variant of concern and mpox, and we organized a meeting for stakeholders in the BReady cohort study.

Grants

European Commission Horizon Europe (101095619): ESCAPE. (EUR 3.2 million; Co-Applicants: Nicola Low, Christian L. Althaus, Emma Hodcroft; 01/2023–12/2026).

Multidisciplinary Center for Infectious Diseases (core activity): The BReady cohort. (CHF 1.8 million; PI: Nicola Low with Gilles Wandeler; 01/2022–12/2024).

Multidisciplinary Center for Infectious Diseases (MA_21): Divided pandemic society and public health: Polarization in the COVID-19 pandemic response in Switzerland. (CHF 720,000; PI: Annika Frahsa, Co-Applicant: Nicola Low; 01/2022–12/2024).

Swiss Cancer Research (9346): Cervical pre-cancer treatment failure among women living with HIV in Zimbabwe: A cohort study. (CHF 372,100; PI: Eliane Rohner, Co-Applicant Nicola Low; 01/2022–12/2025).

Swiss National Science Foundation (320030_197831): Influence of sexually transmitted infections, genital tract infections and the vaginal microbiome on preterm birth. (CHF 720,000; PI: Nicola Low; CHF 720,000; 10/2021–09/2025).

European Commission Horizon 2020 (101003688): Epidemic intelligence to minimize COVID-19's public health, economic and social impact in Europe. (EUR 2.9 million; Co-Applicants Nicola Low, Christian L. Althaus; 03/2020–03/2023).

Swiss National Science Foundation (IZ0720_160909/1): r4d project: Improving neonatal and infant outcomes using point-of-care tests for STI in high prevalence settings. (CHF 488,000; PI: Nicola Low; 03/2016–12/2022).

Swiss National Science Foundation (320030_176233): Zika virus: Causality, open science and risks of emerging infectious diseases. (CHF 700,000; PI: Nicola Low; 10/2017–12/2022).

Swiss Network of International Studies (19/63): Political prioritisation of the prevention and control of sexually transmitted infections: A global challenge. (CHF 246,000; PI: Nicola Low; 01/2020–07/2023).

Internal and external collaborations

At the Institute of Social and Preventive Medicine, we collaborate with the Cancer; Child and Adolescent Health; Community Health and Health Care Systems; HIV, Hepatitis, and Tuberculosis; Interfaculty Platform for Data and Computational Science; and Evidence Synthesis research groups. At the University of Bern, we work with MCID and elsewhere in Switzerland, with colleagues at the University of Zürich.

We work internationally with the Foundation for Professional Development, South Africa; Papua New Guinea Institute of Medical Research; University of New South Wales and University of Melbourne, Australia; Hasselt University, Belgium; University College London, UK; London School of Hygiene and Tropical Medicine, UK; Shenzhen University, China; and the World Health Organization.

Key team members

Diana Buitrago-García (candidate); Ranjana Gigi (PhD candidate); Leonie Heron (postdoc); Eva Maria Hodel (project manager); Hira Imeri (research assistant); Christian Kosok (MD student); Aziz Mert Ipekci (PhD candidate); Nicola Low (head of research group); Gilles Wandeler (co-PI).

Selected publications

Anderegg N, Panczak R, Egger M, Low N, Riou JY. Survival among people hospitalized with COVID-19 in Switzerland: a nationwide population-based analysis. *BMC medicine* 2022;20(1):164.

Buitrago-García D, Ipekci AM, Heron L, Imeri H, Araujo-Chaveron L, Arevalo-Rodriguez I, Ciapponi A, Cevik M, **Hauser A,** Alam MI, Meili K, Meyerowitz EA, Prajapati N, Qiu X, Richterman A, Robles-Rodriguez WG, Thapa S, Zhelyazkov I, **Salanti G, Low N.** Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: Update of a living systematic review and meta-analysis. *PLoS Med* 2022;19(5):e1003987.

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Frenzer C, Egli-Gany D, Vallely LM, Vallely AJ, **Low N.** Adverse pregnancy and perinatal outcomes associated with *Mycoplasma genitalium*: systematic review and meta-analysis. *Sex Transm Infect*. 2022;98(3):222–7.

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Salanti G, Peter N, **Tonia T, Holloway A,** White IR, Darwish L, **Low N, Egger M, Haas AD,** Fazel S, Kessler RC, Herrman H, Kieling C, De Quervain DJF, Vigod SN, Patel V, Li T, Cuijpers P, Cipriani A, Furukawa TA, Leucht S, Investigators MC, Sambo AU, Onishi A, Sato A, Rodolico A, Oliveira Solis AC, Antoniou A, Kapfhammer A, Ceraso A, O'Mahony A, Lasserre AM, **Ipekci AM,** Concerto C, Zangani C, Igwesi-Chidobe C, Diehm C, Demir DD, Wang D, Ostinelli EG, Sahker E, Beraldi GH, Erzin G, Nelson H, Elkis H, Imai H, Wu H, Kamitsis I, Filis I, Michopoulos I, Bighelli I, Hong JSW, Ballesteros J, Smith KA, Yoshida K, Omae K, Trivella M, Tada M, Reinhard MA, Ostacher MJ, Muller M, **Jaramillo NG,** Ferentinos PP, Toyomoto R, Cortese S, Kishimoto S, Covarrubias-Castillo SA, Sifis S, Thompson T, Karageorgiou V, **Chiocchia V,** Zhu Y, Honda Y, Investigators. The impact of the COVID-19 pandemic and associated control measures on the mental health of the general population: A systematic review and dose-response meta-analysis. *Annals of internal medicine* 2022;175(11):1560–71.

SwissRDL – Medical Registries and Data Linkage

SwissRDL is a research and service unit covering all activities in the field of medical registries. Our work includes planning, setting up, operating, and maintaining small regional, national, and international medical registries. To ensure high data quality, we offer support through monitoring visits and central data monitoring. Registry success is shown in detailed reports, statistical analyses, and publications.



In collaboration with external partners, such as medical associations and foundations, we develop, implement, operate, and maintain national and international medical registries and multi-center outcome studies. We ensure high-quality, secure data in our center by applying strict validation rules, monitoring data regularly, and monitoring on site.

Our support team offers help for registry issues and data entry by phone, email, and webinars, and we are in contact with more than 180 hospitals in Switzerland. We also develop and offer full-range support for patient-recorded outcome measures on tablets and websites. Our statisticians and project managers create regular high-quality reports for registries, such as quarterly reports for hospitals, annual scientific reports, operator-specific reports, implant reports for industry, and summaries for the public.

Another core area of SwissRDL excellence is data linkage. We have longstanding experience building up large cohorts, where data are linked using probabilistic record linkage methodology. Our experience led to our expertise linking data without available unique identifiers when simple merging is not possible. We also developed and apply privacy-preserving methods for record linkage. Record linkage procedures are also used to link registry data with federal mortality data.

Key scientific activities

SwissRDL creates high-quality scientific reports, such as the report of the national hip and knee registry. Additionally, we produce benchmark reports for clinics, which allow comparison of core outcomes between hospitals using funnel plots. To support ongoing quality measures in health care, we create outlier reports for surgeons and the implant industry. For medical device suppliers, we offer implant reports for specific products. Furthermore, our data managers and statisticians analyze data for scientific publications and posters.

We support national and international projects with our expertise in record linkage. We also participate in several research projects analyzing registry data and supporting the linkage of additional data. For example, we have been involved in several data linkage projects in Africa, such as one linking HIV data with cancer registry data.

Additionally, we built up a comprehensive implant library which allows identifying and categorizing implants, such as hip, knee, and shoulder. SwissRDL also supports barcode scanner-based data entry and web services for direct data transfer from hospitals.

Key academic activities

Teaching: Adrian Spörri regularly teaches undergraduate and postgraduate students about medical statistical software, medical registries, and probabilistic record linkage methodology at the University of Bern and for international partner organizations. Christian Brand is involved in undergraduate teaching of biostatistics.

Conferences and Events: We participate in International Society of Arthroplasty Registries meetings and conferences.

Outreach and Representation: Through implant registries, we are in touch with medical device suppliers and offer scientific support for reports and studies. We are members of expert committees for the Swiss National Association for Quality Development in Hospitals and Clinics.

Grants

Bundesamt für Gesundheit/Federal Office of Public Health. Schweizerisches Register für seltene Erkrankungen/Swiss Registry for Rare Diseases. (2020–2024).

Internal and external collaborations

Within Switzerland, SwissRDL supports researchers at University Hospital of Bern, Inselspital to create and operate medical registries.

Additionally, we collaborate with medical associations and foundations to operate and maintain their registries, such as the SIRIS foundation and their national hip and knee implant registry with more than 150 hospitals and Swissnoso for surgical site infections with more than 170 hospitals delivering data to SwissRDL.

We also collaborate with the Swiss National Association for Quality Development in Hospitals and Clinics. Supporting data management and reporting for more than 200 Spitex organizations, SwissRDL oversees the Home Care Data platform from Spitex Schweiz.

New registries include the Swiss Cardiology Registry and the Swiss Heart Surgery Registry. We also developed different projects for cantonal health administrations and for hospital groups.

Outside of Switzerland, we are in close contact with international registry providers, such as the National Joint Registry, UK and the Endoprothesenregister Deutschland, Germany.

Key team members

Suada Abukar (IT assistant); Tanja Aegerter (project manager and monitor); Camille Blochet (project manager and monitor); Lilianna Bolliger (project manager and monitor); Andreas Boss (project manager and statistician); Christian Brand (statistician); Nathanaël Cottin (senior software engineer); Martin Drees (head of development); Cyrille Dubray (senior software engineer); Milena Kovatsch (project manager and IT assistant); Mario Morger (co-head SwissRDL); Anna Müller (system administrator); Stefanie Paerschke (administration); Kurt Schmidlin (senior research fellow); Adrian Spörri (co-head of SwissRDL); Ebru Ünlü (project coordinator); Deborah Zulian (research and project assistant).

Selected publications

Muchengeti M, Bartels L, Olago V, Dhokotera T, Chen WC, **Spoerri A, Rohner E, Bütikofer L, Ruffieux Y**, Singh E, **Egger M**, Bohlius J. **Cohort profile: the South African HIV Cancer Match (SAM) study, a national population-based cohort.** *BMJ Open* 2022; 12(4):e053460.

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Cohort-based association study of germline genetic variants with acute and chronic health complications of childhood cancer and its treatment: Genetic Risks for Childhood Cancer Complications Switzerland (GECCOS) study protocol. *BMJ Open*. 2022;12(1):e052131.

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