

Annual Report 2019

Institute of Social and Preventive Medicine ISPM





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December 2019



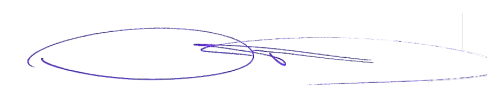
I look back on a successful and exciting year for the Institute of Social and Preventive Medicine. As the new director of ISPM, in 2018, my time was filled with meeting and getting to know all members of ISPM and its collaborating institutes, CTU and BIHAM. Also from the outset, ISPM has been expanding into new specialities across faculties and collaborations nationally and internationally.

ISPM2030, the vision jointly developed with all members of the institute, is well on its way from development to implementation. We established a new research group, Climate Change and Health, in collaboration with the Oeschger Centre for Climate Change Research and the Medical Faculty. Collaboration with Swiss Paraplegic Research in Nottwil has added a new field of research at ISPM with PhD students and postdocs jointly supervised at both institutes. The Cardiometabolic Research Group was further consolidated and has grown, working closely with colleagues from Inselspital.

Public health concerns people around the globe and we are very excited to have been able to initiate and strengthen collaborations with universities in the USA (Harvard), Colombia (Antioquia, FUCS, Javeriana, Magdalena), Canada (Western Ontario), and the Netherlands (Amsterdam). With these partners we are building exchange and training programs in addition to joint research projects. Longstanding collaborations with countries in Southern Africa continue on the same successful level.

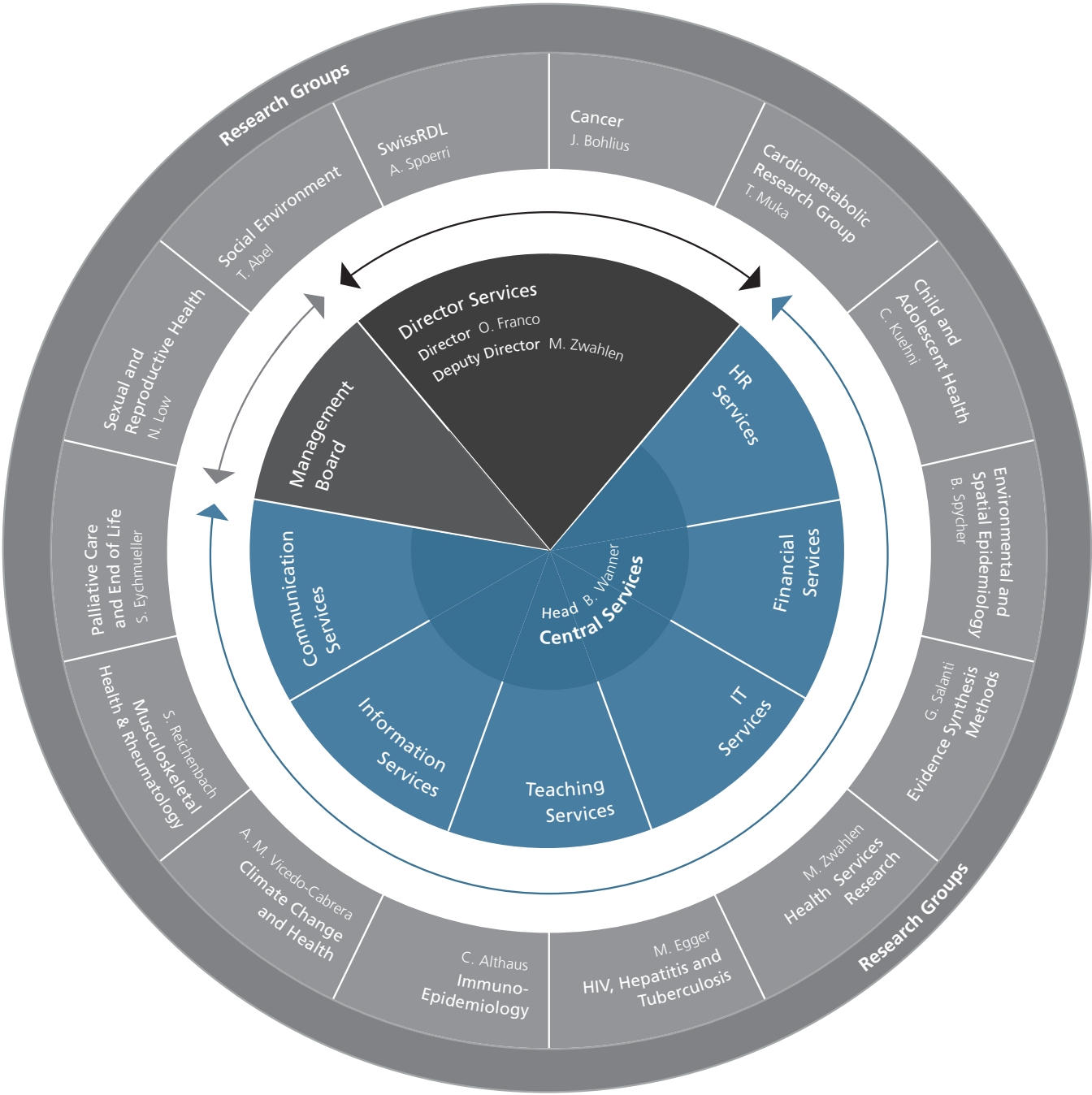
We strongly believe that knowledge has value only when it is shared. The monthly Bern Lectures in Health Science, organized and carried out with CTU and BIHAM, and the flagship courses during our highly regarded Winter School and onsite in Bern are only a part of how we put this guiding principle into practice.

I would like to thank all ISPM staff for their engagement and efforts advancing our research. I look forward to another very fruitful year!



Oscar H. Franco

Organizational Chart



ISPM Facts and Figures

Our research profile covers health areas from cardio-metabolic to HIV, cancer, childhood and adolescents, NCDs to environmental influence, with the tiers of development of new methods and lifestyle and behavior reaching across all fields.

We actively participate in University teaching programs for students of medicine, biomedical engineering and biomedicine (including students from the University of Fribourg) and are engaged in PhD and postgraduate programs of the University of Bern and SSPH+.

Staff

Prof. Dr. med. Oscar Franco
Director

Prof. Marcel Zwahlen
Deputy Director

Staff members total per 31.12.2019		128 (84w, 66% / 51m, 34%)
Research		111
PhD students		34 (25w 74% / 9m, 26%)
Admin, technics		17 (covering 3 institutes)
Nationalities		23
Research groups		14

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
- Interuniversity Public Health Education**
MPH, DAS, CAS
- Medical Specialist in Prevention and Public Health**
Certified training facility
- Bern Lectures in Health Science**
9 monthly seminars

Teaching

Total numbers	
Course fees	CHF 979'486
Courses	64
Course attendees	1316

Grants

Grants, new in 2019
1 SNSF Ambizione
1 SNSF
1 Horizon 2020
3 Swiss Cancer Research

3rd Party money spent	
SNF	CHF 2'719431
Other competitive	CHF 4'454997
Non-competitive	CHF 2'577696

Publications

Publications total	223
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Reports
from the
Research
Groups

Cancer

The ISPM cancer working group does clinical and epidemiological studies at the intersection of HIV and cancer at global scale. We have the following major research areas:

- *Improvement of cancer ascertainment in HIV-cohorts through record linkages with cancer registries*
- *Improving access to and effectiveness of cervical cancer screening in women living with HIV*
- *Evidence synthesis in oncological interventions and guideline development*

Key scientific activities

Record linkage projects:

A record linkage project between the National Cancer Registry in Malawi and an HIV cohort in Malawi has been completed and published. A similar record linkage project in Zimbabwe is ongoing. For the South African Cancer Match Study (SAM) we drew a total of 44 million lab records from the National Health Laboratory Services (HIV-ELISA test results, CD4 cell counts and HIV-RNA viral load measurements) for the period 2004-2014 and created a cohort of 12 million persons living with HIV and linked these to National Cancer Registry (NCR) data. We used privacy preserving probabilistic record linkages (G-Link) as well as Python based linkage algorithms to identify records belonging to the same person in the HIV dataset (linkage within HIV database) and the NCR (linkage between datasets). The linkages were also used to assign HIV status to the records of the NCR. Several analyses on different cancer types such as cervical cancer, breast cancer, and conjunctiva cancer are ongoing.

Cervical cancer screening in women living with HIV:

Our international comparison study demonstrated massive inequities in cervical cancer risk in women living with HIV in South Africa compared to Europe and the US. To improve access to and quality of cervical cancer screening, we are developing a cervical cancer prevention and care cascade to determine and implement key indicators to scale-up and monitor cervical cancer screening for women living with HIV in Africa. The project is carried out in close collaboration with the International epidemiology Databases to Evaluate AIDS (IeDEA) and the International Agency for Research on Cancer (IARC). To investigate better screening methods for precancerous cervical lesions in women living with HIV in low income settings, we evaluate the diagnostic accuracy of a portable colposcopy in comparison to visual inspection with acetic acid and high-risk HPV testing. The project is done in collaboration with the Centre for Infectious Disease Research in Zambia and the Cervical Cancer Prevention Program in Zambia.

Evidence synthesis:

We contributed to the update of the cancer anemia treatment guidelines of the American Society of Clinical Oncology and the American Society of Hematology.

Key academic activities

Several international PhD students have joined the ISPM Cancer Working Group:

Katayoun Taghavi, board certified gynecologist, started her PhD on the Gynocular project in 01/2017

Serra Asangbeh started her PhD on the Cascade project in 10/2018. She obtained a SSPH+ Global PhD Fellowship Program in Public Health Sciences funded by Marie Skłodowska-Curie Actions (Horizon 2020 - COFUND) and Swiss Government Excellence Scholarship

Tafadzwa Dhokotera, NCR, Johannesburg, South Africa, started her PhD using the SAM data in 04/2019. She obtained an SSPH+ Global PhD Fellowship Program in Public Health Sciences funded by Marie Skłodowska-Curie Actions (Horizon 2020 - COFUND).

Maša Davidović started her PhD on the Cascade project in 4/2019. She obtained an SSPH+ Global PhD Fellowship Program in Public Health Sciences funded by Marie Skłodowska-Curie Actions (Horizon 2020 - COFUND).

Mwansa Lumpa started his PhD on record linkages to inform the Cascade in 10/2019. He obtained an SSPH+ Global PhD Fellowship Program in Public Health Sciences funded by Marie Skłodowska-Curie Actions (Horizon 2020 - COFUND).

PhD students Serra Asangbeh, Tafadzwa Dhokotera and Maša Davidović



Grants

Ongoing grants are as follows:

Swiss Cancer Research (10/2019–09/2022): Molecular epidemiology of lung cancer brain metastases (KFS-4694-02-2019) (365,500 CHF, coapplicant Bohlius)

National Cancer Institute, USA (07/2019–06/2021): Multiregional Cervical Cancer Care Cascade (supplement to 5U01AI069924-12) (454,372 USD, project lead Bohlius)

Swiss National Science Foundation (10/2018–09/2022): Advancing Cervical Cancer Screening in HIV-positive women (ACCHiVe) – The Cervical Cancer Prevention and Care Cascade (IZ08Z0_177319) (600,000 CHF, principal investigator Bohlius)

Esther Switzerland (07/2018–06/2019): Colposcopy Telemedicine partnership: Strengthening cervical cancer screening in Zambia (Esther17G9) (99,885 CHF, principal investigator Bohlius)

Swiss Cancer Research (07/2017–06/2021): Impact of guidelines adherence on efficacy and safety of health care provided to Swiss MDS patients (HSR-4085-11-2016) (135,000 CHF, coapplicant Bohlius)

Swiss Cancer Research (07/2017- 07/2020): Improving cervical cancer screening among HIV-positive women in Southern Africa (KFS-4156-02-2017) (272,050 CHF, principal investigator Bohlius)

National Cancer Institute, USA (07/2017-06/2019): Cervical Cancer Care Cascade (supplement 5U01AI069924-12) (160,529 USD, Bohlius project lead)

SNSF (10/2016-09/2019): The South African HIV Cancer Match Study (320030_169967) (505,457 CHF, Bohlius principal investigator)

Statistician Lina Bartels and PhD student Mwansa Lumpa



PhD student Katayoun Taghavi and study nurse in Lusaka, Zambia



Internal and external collaborations

Inselspital Bern, Universitätsklinik für Hämatologie und Hämatologisches Zentrallabor
International epidemiology Databases to Evaluate AIDS
Centre for Infectious Disease Research in Zambia
Cervical Cancer Prevention Program in Zambia
National Cancer Registry of South Africa
National Cancer Registry of Malawi
National Cancer Registry of Zimbabwe

Key team members

Head of working group Julia Bohlius
Team members in alphabetical order: Serra Lem Asangbeh, Lina Bartels, Masa Davidovic, Tafadzwa Dhokotera, Matthias Egger, Kurt Schmidlin, Adrian Spörri, Katayoun Taghavi, Marcel Zwahlen.

Selected publications

Rohner E, Bütikofer L, Schmidlin K, Sengayi M, Maskew M, Giddy J, Taghavi K, Moore RD, Goedert JJ, Gill MJ, Silverberg MJ, D'Souza G, Patel P, Castilho JL, Ross J, Sohn A, Bani-Sadr F, Taylor N, Paparizos V, Bonnet F, Verbon A, Vehreschild JJ, Post FA, Sabin C, Mocroft A, Dronda F, Obel N, Grabar S, Spagnuolo V, Quiros-Roldan E, Mussini C, Miro JM, Meyer L, Hasse B, Konopnicki D, Roca B, Barger D, Clifford GM, Franceschi S, Egger M, Bohlius J. **Cervical cancer risk in women living with HIV across four continents: A multicohort study.** Int J Cancer. 2020 Feb 1;146(3):601-609. doi: 10.1002/ijc.32260. Epub 2019 Jun 19. PubMed PMID: 31215037; PubMed Central PMCID: PMC6898726.

Dhokotera T, Bohlius J, Spoerri A, Egger M, Ncayiyana J, Olago V, Singh E, Sengayi M. **The burden of cancers associated with HIV in the South African public health sector, 2004-2014: a record linkage study.** Infect Agent Cancer. 2019 May 3;14:12. doi: 10.1186/s13027-019-0228-7. eCollection 2019. PubMed PMID: 31073325; PubMed Central PMCID: PMC6500038.

Bohlius J, Bohlke K, Castelli R, Djulbegovic B, Lustberg MB, Martino M, Mountzios G, Peswani N, Porter L, Tanaka TN, Trifirò G, Yang H, Lazo-Langner A. **Management of cancer-associated anemia with erythropoiesis-stimulating agents: ASCO/ASH clinical practice guideline update.** Blood Adv. 2019 Apr 23;3(8):1197-1210. doi: 10.1182/bloodadvances.2018030387. Review. PubMed PMID: 30971397; PubMed Central PMCID: PMC6482353.

Affentranger L, Bohlius J, Hallal M, Bonadies N. **Efficacy of granulocyte colony stimulating factor in combination with erythropoiesis stimulating agents for treatment of anemia in patients with lower risk myelodysplastic syndromes: A systematic review.** Crit Rev Oncol Hematol. 2019 Apr;136:37-47. doi: 10.1016/j.critrevonc.2019.01.021. Epub 2019 Feb 15. PubMed PMID: 30878127.

Horner MJ, Chasimpha S, Spoerri A, Edwards J, Bohlius J, Tweya H, Tembo P, Nkhambule F, Phiri EM, Miller WC, Malisita K, Phiri S, Dzamalala C, Olshan AF, Gopal S. **High Cancer Burden Among Antiretroviral Therapy Users in Malawi: A Record Linkage Study of Observational Human Immunodeficiency Virus Cohorts and Cancer Registry Data.** Clin Infect Dis. 2019 Aug 16;69(5):829-835. doi: 10.1093/cid/ciy960. PubMed PMID: 30452634; PubMed Central PMCID: PMC6773978.

Cardiometabolic Research

The Cardiometabolic Research Group puts epidemiologic principles into practice in clinical and public health. Our research focuses on understanding the roles of risk factors and mechanisms underlying the development and prognosis of cardiometabolic diseases to develop better prevention and detection tools for cardiometabolic diseases.

Key scientific activities

The research group has conducted new studies of women's health that include dynamic changes in women's intermediate cardiovascular risk factors across reproductive stages, dietary changes before and after menopause, the association between plant-based diet and age of menopause onset, causal relations between age of menopause and blood pressure traits, and the role of iron in sex and menopausal differences in cardiometabolic diseases. In studies of thyroid function, diabetes and cardiovascular disease, the group has investigated the epigenetic markers mediating the diabetogenic effects of statins, the role of thyroid function in myocardial fibrosis and life expectancy with and without cardiometabolic disease, and the impact of glycemic status and glycemic control on the risk of developing myocardial fibrosis. Further activities have included assessment of cardiometabolic profile in spinal cord injury patients, assessment of mood and anxiety disorders in migrants, and phytochemical composition of 15 plants such as radish and Swiss chard.

Key academic activities

Lectures in clinical epidemiology, public health, systematic reviews and meta-analysis, and GRADE assessment.

Grants

Ongoing:
Swiss National Science Foundation. (LYRICA: LifestYle pRevention Cardiovascular Ageing. Oscar H. Franco (PI), April 2020-April 2024, CHF 700,000

Leading House for the Latina American Region, Switzerland: 25,000 CHF. Circulating microRNA and cardiac biomarkers to detect and classify cardiac involvement and its prognosis in Chagas disease. Taulant Muka (PI), January 2020-January 2021, CHF 25,000

New:
Swiss National Science Foundation (IZSTZO_190277). Spirit grant, Non-caloric sweeteners, microbiome and cardiometabolic risk - a randomized clinical trial of Iranian women. Oscar H. Franco (PI), Taulant Muka (PI), October 2020-October 2023, CHF 500,000.

Astra Zeneca. Prevalence of Heart Failure in Switzerland. Taulant Muka (PI), April 2020-October 2021, CHF 140,000

Internal and external collaborations

Department of Cardiology, Inselspital, Bern; Department of Angiology, Inselspital, Bern; Department of Nuclear Medicine, University Hospital Zurich, Zurich; University of Lausanne; Swiss Paraplegic Research Center, Nottwil; HELIUS, University of Amsterdam; School of Public Health, Imperial College London, London; Department of Epidemiology, Erasmus Medical Center, Rotterdam; Institute of Community Medicine, University of Greifswald, Greifswald, Germany; Epigenomics Research Group, King's College London, London.

Key team members

Oscar H. Franco (Group leader), Taulant Muka (Group Leader), Arjola Bano (postdoc), Marija Glisic (postdoc), Cristina Mesa (PhD student), Dante Jr Salvador (PhD student), Giorgia Grisotto (PhD student), Magda Gamba (PhD student), Nathali Gonzeles (PhD student), Oche Adam Itodo (PhD student), Peter Francis Raguindin (PhD student), Valentina Gonzales (PhD student), Zayne RoaZ (PhD student).

Selected publications

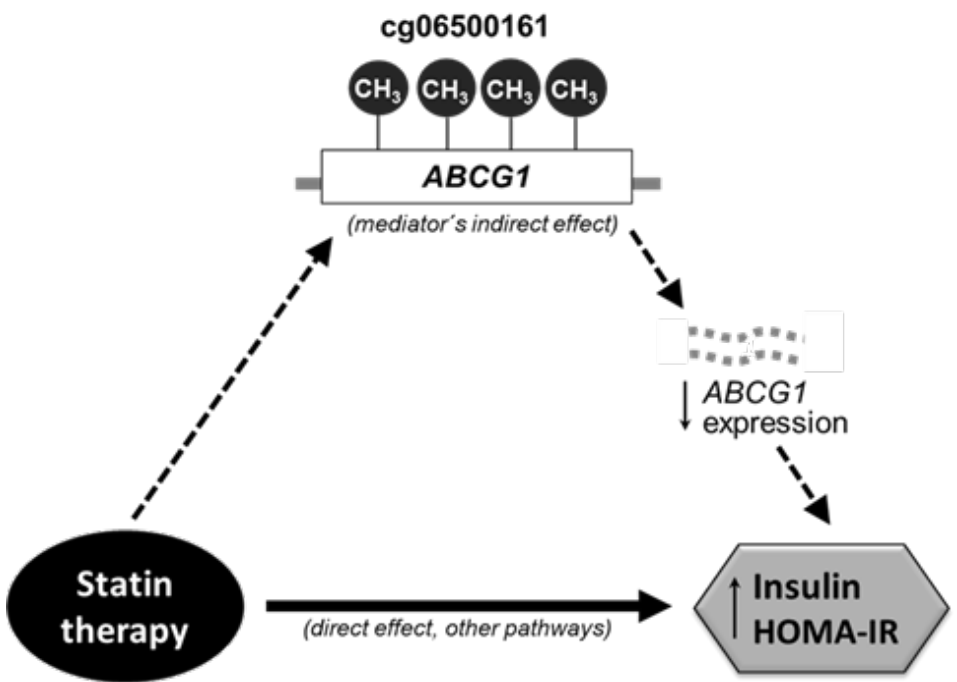
Ochoa-Rosales C, Portilla-Fernandez E, Nano J, Wilson R, Lehne B, Mishra PP, et al. **Epigenetic Link Between Statin Therapy and Type 2 Diabetes.** Diabetes Care. 2020;43(4):875-84.

Muka T, Glisic M, Milic J, Verhoog S, Bohlius J, Bramer W, et al. **A 24-step guide on how to design, conduct, and successfully publish a systematic review and meta-analysis in medical research.** Eur J Epidemiol. 2020;35(1):49-60.

Bano A, Chaker L, Muka T, Mattace-Raso FUS, Bally L, Franco OH, et al. **Thyroid Function and the Risk of Fibrosis of the Liver, Heart, and Lung in Humans: A Systematic Review and Meta-Analysis.** Thyroid. 2020.

Li Y, Schoufour J, Wang DD, Dhana K, Pan A, Liu X, et al. **Healthy lifestyle and life expectancy free of cancer, cardiovascular disease, and type 2 diabetes: prospective cohort study.** BMJ. 2020;368:l6669.

Bano A, Chaker L, Mattace-Raso FUS, Terzikhan N, Kavousi M, Ikram MA, et al. **Thyroid function and life expectancy with and without noncommunicable diseases: A population-based study.** PLoS Med. 2019;16(10):e1002957.



Scheme of the hypothesized mechanism linking statin therapy and risk of type 2 diabetes

Child and Adolescent Health

1. Paediatric Respiratory Epidemiology Group

The Paediatric Respiratory Epidemiology Group studies the epidemiology of common and rare respiratory disorders during childhood and throughout life. The main areas of interest are asthma and other wheezing disorders, chronic cough, cystic fibrosis (CF), and primary ciliary dyskinesia (PCD). In particular we are looking into the role of environmental and behavioural influences on the development of respiratory disorders, the prediction of clinical course of respiratory disorders, and into phenotypes of diseases such as asthma and PCD.

Key scientific activities

We conduct population-based and clinical cohort studies, and manage national databases and registries including the following:



Swiss Paediatric Airway Cohort (SPAC): The SPAC (<https://spac-study.ch/>) is a prospective, observational study with a national, multicentre clinical cohort, which includes children referred to paediatric respiratory outpatient clinics due to wheeze, recurrent cough, exercise- and sleep-related respiratory problems. In 2019, a focus was on the role of clinical symptoms and physiological tests in the diagnosis of childhood asthma and the spectrum of exercise-induced symptoms in school-aged children.

Leicester Respiratory Cohorts (LRC): The LRC (<https://www.leicestercohorts.org>) are large population-based cohorts including more than 10,000 children from Leicestershire, UK. We studied night cough in children and did an external validation of the PARC asthma prediction tool.

Luftibus in the School is a population-based study of respiratory health in school-aged children in the canton of Zurich, which combines questionnaire-based information from parents and children with novel lung function tests and air pollution data. Last year, we investigated smoking in school-aged children and the agreement between symptoms reported by parents and children.

International PCD (iPCD) Cohort: The iPCD Cohort is an international cohort representing the largest available dataset of this rare disease with a retrospective and a prospective arm. The iPCD Cohort combines data on PCD from national and local registries, and clinical and diagnostic databases. We assessed time trends in diagnostic testing for PCD and the role of neonatal symptoms in timely PCD diagnosis as well as lung growth trajectories in children and young adults with PCD.



Swiss PCD registry (CH-PCD): The CH-PCD is a national registry that includes patients of any age who suffer from PCD, who are treated and resident in Switzerland. We developed a national survey to study prevalence and severity of patient-reported symptoms and health-related behaviours of PCD patients in Switzerland.

Ear-Nose-Throat (ENT) Prospective International Cohort of PCD patients (EPIC-PCD): The EPIC-PCD is a newly founded, multicentre prospective cohort that will study the characteristics and prognosis of upper respiratory disease in patients with PCD.

In addition to these studies, we participated in a European Respiratory Society Task Force for the development of evidence-based guidelines for the diagnosis of childhood asthma. We also led a multinational, multidisciplinary group of experts for the development of a disease-specific standardised form for clinical follow-up of patients with PCD and real-time data collection for research, including a patient questionnaire.

Key academic activities

Students: During 2019, the group included six PhD candidates (among whom Florian Halbeisen defended his PhD in February 2019), two medical students who started an MD thesis and five medical students who completed a master's thesis.

Organization of conferences: Co-organization of the 4th BEAT-PCD Conference and 5th Training School in Poznan, Poland (March 2019).

Fellowships/Prizes: Myrofora Goutaki received a European Respiratory Society short-term fellowship for a research visit at the PCD centre at the University of Southampton in the UK, and Carmen de Jong was awarded the prize for the best oral presentation of the SwissPedNet Translational & Clinical Research session at the Swiss Conference for Pediatrics (SGP).

Teaching: Regular teaching with lectures and tutoring in undergraduate and postgraduate students (University of Bern, MPH program) by Claudia Kuehni, Myrofora Goutaki, Christina Ardura-Garcia, Eva Pedersen, Carmen de Jong, and Rebeca Mozun.

Grants

Swiss National Science Foundation (SNSF 320030_173044/1): Natural history, phenotypes, and disease classification in primary ciliary dyskinesia (CHF 456'055; 04/2017–03/2020; PI Claudia Kuehni)

Swiss National Science Foundation (SNSF 320030B_192804): Natural history, phenotypes, and disease classification in primary ciliary dyskinesia (phase 2) (CHF 447'055; 05/2020–04/2023; PI Claudia Kuehni)

Swiss National Science Foundation (SNSF 32003B_162820): Phenotypes and prognostic modelling in childhood asthma moving towards clinical applications (CHF 556'733; 10/2015 – 09/2018; PI Claudia Kuehni)

Swiss National Science Foundation (SNSF PZ00P3_185923 Ambizione): From the nose to the lungs: the importance of upper respiratory disease in primary ciliary dyskinesia (CHF 950'34; 10/2019–09/2023; PI Myrofora Goutaki)

Swiss Lung League: Predicting asthma attacks in Swiss children: SPAG-Attacks, a clinical cohort study (CHF 67'300; 07/2019–06/2021; PI Cristina Ardura-Garcia)

Internal and external collaborations

Over the course of collaborative projects that have included the BEAT-PCD Cost Action, for which Claudia Kuehni was a cochair, the Paediatric Respiratory Epidemiology Research Group has developed an extensive national and international multidisciplinary network of researchers, clinicians, and scientists who work on paediatric and rare respiratory diseases.

Key team members

Claudia Kuehni (group leader), Myrofora Goutaki (senior researcher), Cristina Ardura-Garcia (postdoc), Eva Sophie Lunde Pedersen (postdoc), Carmen de Jong (PhD graduate), Rebeca Mozun (PhD candidate), Maria Christina Mallet (PhD candidate), Eugenie Collaud (PhD candidate), Helena Koppe (research assistant), Natalie Messerli (research assistant)



Interesting discussions and nice dinner during the ERS paediatric assembly networking even



Celebrating successful presentations after a paediatric respiratory epidemiology research session



The Paediatric Respiratory Epidemiology Group enjoying time together in the European Respiratory Society (ERS) conference in Madrid

Selected publications

Halbeisen FS, Shoemark A, Barbato A, Boon M, Carr S, Crowley S, Hirst R, Karadag B, Koerner-Rettberg C, Loebinger MR, Lucas JS, Maitre B, Mazurek H, Özçelik U, Martinů V, Schwerk N, Thouvenin G, Tschanz SA, Yiallourous P, Goutaki M*, Kuehni CE*. **Time trends in diagnostic testing for PCD in Europe.** Eur Respir J. 2019 Jul 18. pii: 1900528. doi: 10.1183/13993003.00528-2019 *Both authors contributed equally

Goutaki M, Eich M, Halbeisen FS, Barben J, Casaulta C, Clarenbach C, Hafen G, Latzin P, Regamey N, Lazor R, Tschanz S, Zanolari M, Maurer E, Kuehni CE. **The Swiss Primary Ciliary Dyskinesia registry: objectives, methods and first results.** Swiss Med Wkly. 2019 Jan 13;149. pii: w20004. doi: 10.4414/smw.2019.20004

de Jong CCM, Pedersen ESL, Mozun R, Goutaki M, Trachsel D, Barben J, Kuehni CE. **Diagnosis of asthma in children: the contribution of a detailed history and test results.** Eur Respir J. 2019 Dec 4;54(6). Pii: 1901326. Doi: 10.1183/13993003.01326-2019

de Jong CCM, Pedersen ES, Goutaki M, Trachsel D, Barben J, Kuehni CE. **Do clinical investigations predict long-term wheeze? A follow-up of pediatric respiratory outpatients.** Pediatr Pulmonol. 2019 Aug;54(8):1156-1161. doi: 10.1002/ppul.24347.

Pedersen ESL, Spycher BD, de Jong CCM, Halbeisen F, Ramette A, Gaillard EA, Granell R, Henderson AJ, Kuehni CE. **The Simple 10-Item Predicting Asthma Risk in Children Tool to Predict Childhood Asthma – an External Validation.** J Allergy Clin Immunol Pract. 2019 Mar;7(3):943-953.e4. doi: 10.1016/j.jaip.2018.09.032.

2. Paediatric Cancer

Our main activities involve the registration of paediatric cancer cases in Switzerland (section 2a – Childhood Cancer Registry (ChCR) and the epidemiology of childhood cancer over the life course (section 2b – Paediatric Cancer Epidemiology Group).

2.a Childhood Cancer Registry

From 1976 to the end of 2019, the former *Swiss Childhood Cancer Registry (SCCR)* gathered data on all children and adolescents up to 20 years old diagnosed with cancer. On 1 January 2020, the Cancer Registration Act/Krebsregistrierungsgesetz (CRA/KRG; SR 818.33) and the related Cancer Registration Ordinance (CRO/KRV; SR 818.331) came into force making cancer registration in Switzerland compulsory. The SCCR, as a consortium consisting of the Swiss Paediatric Oncology Group and the Institute of Social and Preventive Medicine (ISPM) successfully applied for the federal task of maintaining the registry under the CRA/KRG.

Since January 2020, the former SCCR continues as the Swiss-wide registration of childhood and adolescent childhood cancer cases under the new name *Childhood Cancer Registry (ChCR)*. The research part of the former SCCR will be conducted as a separate Research Platform. During 2019, the Childhood Cancer Registry's team, managed by Dr. Verena Pfeiffer and Prof. Dr. med. Claudia Kuehni, prepared the implementation of the new law and the structural changes due to this new law as described under key scientific activities.



Key scientific activities

We were involved in the registration of childhood cancer cases in Switzerland through these activities:

- Support the Federal Office of Public Health (FOPH) with the implementation of the new law
- Informing the public about the new law (e.g. press release)
- Informing oncologists and clinics, etc. that treat childhood cancer about their obligation to report and how to report their cases
- Developing forms to report cases
- Development of the website for the Childhood Cancer Registry in German, French, Italian, and English (www.childhoodcancerregistry.ch)
- Ensuring that the quality and protection of data
- Preparing for the migration of the data collected from 1976 to 2019 to the new register software
- Investigating how to separate the registration activities and the research activities without delaying research

Key academic activities

National collaboration:
Nationale Strategie Krebs (NSK): Interview «Jede Zahl wird genutzt» by the NSK with coheads Claudia Kuehni and Verena Pfeiffer. They report on the commitment, wishes, and concerns for the restructuring due to the new law:
<https://www.kinderkrebsregister.ch/2019/07/31/nationale-strategie-gegen-krebs-jede-zahl-wird-genutzt/>

National conferences:
Swiss Oncology and Haematology Congress (SOHC): “The Swiss Childhood Cancer Registry and the cancer registration law”, talk by Verena Pfeiffer and Claudia Kuehni, Zürich, Switzerland (June 27and 28, 2019)

Swiss Paediatric Oncology Group (SPOG): Scientific Meeting in Lugano, Switzerland (February 2 and 3, 2019)

Grants

Schweizerische Konferenz der kantonalen Gesundheitsdirektoren: CHF 150’000

Swiss Paediatric Oncology Group: CHF 75’000

Swiss Cancer Research: CHF 100’000

Federal Office of Public Health (via National Institute for Cancer Epidemiology and Registration: CHF 20’000, preparatory work by the ChCR for the Cancer Registration Act is also financed by the FOPH

National Institute for Cancer Epidemiology and Registration: Forschungsbeitrag CHF 8’000

Childhood Cancer Switzerland: CHF 14’319

Internal and external collaborations

The Childhood Cancer Registry (ChCR) collaborates closely with the Swiss Federal Office of Public Health (FOPH), the National Agency for Cancer Registration (NACR), and the Paediatric Cancer Epidemiology Group of ISPM at the University of Bern.

Key team members

Verena Pfeiffer (Codirector), Claudia Kuehni (Codirector), Sara Restrepo-Vassalli (coordination), Shelagh Redmond (medical coding and data quality management), Ersebet Kiraly (medical coding), Erika Brantschen (medical coding and clinical data management), Erika Minder (clinical data management), Meltem Altun (clinical data management), Ursina Roder (data management), Ben Spycher (head of statistics), Anna Müller (system administrator), Katharina Flandera (administration)

2.b Paediatric Cancer Epidemiology Group

The Paediatric Cancer Epidemiology Group studies the epidemiology of childhood cancer throughout life. Our main areas of interest involve long-term outcomes after childhood cancer. This includes 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 cause-specific long-term mortality.

Key scientific activities

We conduct different population-based and prospective clinical follow-up studies on long-term outcomes after childhood cancer, including the following:

Swiss Childhood Cancer Survivor Study (SCCSS): The SCCSS is a nationwide population-based questionnaire survey continuously including all childhood cancer patients registered in the Childhood Cancer Registry who survived >5 years after the cancer diagnosis. We study the spectrum of somatic and psychosocial outcomes childhood cancer survivors experience, health-related quality of life, and health behaviours. **SCCSS-Nutrition** is a substudy of the SCCSS focusing on dietary behaviours and analysis of urine samples of survivors.

Prospective clinical studies: Several prospective clinical studies have been set up to study organ-specific outcomes after childhood cancer longitudinally based on clinical examinations. One study focuses on early detection of cardiac dysfunction in survivors and uses a novel echocardiographic imaging technique called speckle tracking echocardiography. Another study investigates pulmonary complications after cancer treatment with both conventional and novel lung function measures.



Swiss Paediatric Haematology/Oncology Metabank (Biolink): The Metabank project will link the Childhood Cancer Registry with two biobanks, the Swiss germline DNA Biobank for Childhood Cancer and Blood Disorders (BISKIDS) and the Swiss Pediatric Hematology Oncology Biobank Network (SPHO). Biolink will enable in-depth research in the fields of cancer predispositions, pharmacogenetics, and genetic modifiers of long-term complications after childhood cancer.



Genetic Risks for Complications in Children after Oncological Treatment in Switzerland (GECCOS): The aim of the GECCOS project is to find genetic risk factors of complications after childhood cancer. We will use DNA samples of Swiss childhood cancer patients from the BISKIDS Biobank to study genetic differences between patients and test whether they are associated with long-term complications following treatment. This will help us better understand why some patients develop complications after childhood cancer treatment and others not.

PanCare Childhood and Adolescent Cancer Survivor Care and Follow-up Studies (PanCareSurFup): This project investigates the burden and risk factors of the most severe and life threatening late effects: secondary neoplasms and cardiovascular disease, and premature death. We contributed with 4719 Swiss five-year survivors to the Pan-European cohort and provided detailed treatment data from medical records of 139 Swiss survivors.

PanCare Studies on Fertility and Ototoxicity to Improve Quality of Life after Cancer during Childhood, Adolescence and Young Adulthood (PanCareLIFE): This project

investigates hearing loss, infertility, and quality of life after childhood cancer. We identified 304 survivors at risk for hearing loss and collected their hearing tests. Among the 304 survivors, we contacted 221 survivors for the collection of saliva samples and 153 survivors provided their saliva sample for the analysis of genetic risk factors for hearing loss. We contributed with SCCSS questionnaire data from 1585 survivors on hearing loss, fertility, and quality of life.

In addition to these studies, our group is also closely involved in the International Late Effects of Childhood Cancer Guideline Harmonization Group (www.ighg.org), which aims at developing standardised recommendations for follow-up surveillance after childhood cancer.

Key academic activities

Students: During 2019, the group included four PhD students and one medical student who completed her MD master's thesis.

Organization of conferences: Nicolas Waespe is cofounder, scientific cochair and organizer of the 2nd NextGen Research Day on November 21, 2019, a full-day workshop for young pediatric researchers.

Teaching: Regular teaching with lectures and tutoring in undergraduate and postgraduate students (University of Bern, MPH program) by Claudia Kuehni, Maria Otth, and Nicolas Waespe.

Grants

FORCE Fondation: Dietary intake and overweight in childhood cancer (CHF 27'750; 04/2019-06/2019; PI Fabiën Belle)

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

Stiftung für krebskranke Kinder, Regio Basiliensis (2019-P012): Early detection of cardiac dysfunction in survivors of childhood cancer (01/2020-06/2020; CHF 28'773; PI Christina Schindera)

Swiss Cancer Research, Swiss Cancer League (KLS/KFS-4825-01-2019): Structural funding for Swiss Childhood Cancer Survivor Study (CHF 480'000; 09/2019-12/2021; PI Claudia Kuehni)

Swiss National Science Foundation (31BL30_185396): The Swiss Pediatric Hematology/ Oncology Metabank – a network for precision medicine research (CHF 593'638; PI Jean-Pierre Bourquin, co-PIC M. Ansari and C. Kuehni)

Internal and external collaborations

The Paediatric Cancer Epidemiology Research Group has an extensive national and international multidisciplinary network consisting of leading researchers and clinicians in the field of late effects of childhood cancer. This includes the European-wide collaborations PanCare-SurFup (<http://www.pancaresurfup.eu/>) and PanCareLIFE (<http://www.pancarelife.eu/>).

Key team members

Claudia Kuehni (group leader), Fabiën Belle (postdoc), Luzius Mader (postdoc), Nicolas Waespe (PhD candidate), Christina Schindera (PhD candidate), Maria Otth (PhD candidate), Sven Strebel (PhD candidate) Nadine Lötscher (research assistant)



Claudia Kuehni



Fabiën Belle-van Sprundel



Luzius Mader



Nicolas Waespe



Christina Schindera



Maria Otth



Sven Strebel

Selected publications

Sommer G, Schindler M, Redmond S, Pfeiffer V, Konstantinoudis G, Ammann RA, Ansari M, Hengartner H, Michel G, Kuehni CE. **Temporal trends in incidence of childhood cancer in Switzerland, 1985-2014.** Cancer Epidemiol. 2019 Aug;61:157-164. doi: 10.1016/j.canep.2019.06.002.

Hau EM, Caccia JN, Kasteler R, Spycher BD, Suter T, Ammann RA, von der Weid NX, Kuehni CE. **Cardiovascular disease after childhood acute lymphoblastic leukemia: a cohort study.** Swiss Med Wkly. 2019;149:w20012. doi: 10.4414/smw.2019.20012.

Essig S, Michel G, Dupont C, Kiss A, Bergstraesser E, Tinner Oehler EM, Kuehni CE. **Communicating “cure” to pediatric oncology patients: A mixed methods study.** Pediatr Blood & Cancer. 2019:e27661. doi: 10.1002/pbc.27661.

Kasteler R, Belle F, Schindera C, Barben J, Gumy-Pause F, Tinner EM, Claudia E. Kuehni. **Prevalence and reasons for smoking in adolescent Swiss childhood cancer survivors.** Pediatr Blood & Cancer. 2019;66(1):e27438. doi: 10.1002/pbc.27438.

Clemens E, van den Heuvel-Eibrink MM, Mulder RL, Kremer LCM, Hudson MM, Skinner R, Constine LS, Bass JK, Kuehni CE, Langer T, van Dalen EC, Bardi E, Bonne NX, Brock PR, Brooks B, Carleton B, Caron E, Chang KW, Johnston K, Knight K, Nathan PC, Orgel E, Prasad PK, Rottenberg J, Scheinemann K, de Vries ACH, Walwyn T, Weiss A, Am Zehnhoff-Dinnesen A, Cohn RJ, Landier W. **Recommendations for ototoxicity surveillance for childhood, adolescent, and young adult cancer survivors: a report from the International Late Effects of Childhood Cancer Guideline Harmonization Group in collaboration with the PanCare Consortium.** Lancet Oncol. 2019;20(1):e29-e41. doi: 10.1016/S14702045(18)30858.

3. Paediatric and Rare Diseases Registries Group

The Paediatric and Rare Diseases Registries Group hosts several medical registries and conducts studies in different areas of paediatric epidemiology, such as endocrinology, gastroenterology, nephrology, neurology and rare diseases. The research is based on cohort studies in Switzerland, Europe and on international collaborations. These registries collect data on specific diseases to better understand and treat them and thus improve patients’ quality of life. The registries are both research and communication platforms. They help to answer specific research questions, to recruit patients for clinical studies, to coordinate the post-marketing surveillance of drugs and to connect researchers nationally and internationally and thus disseminate knowledge.

Key scientific activities

The Paediatric and Rare Disease Registries Group coordinates platforms, national registries and cohort studies:

SwissPedRegistry, led by Claudia Kuehni, is a research platform for paediatric registries. It is part of SwissPedNet, the Swiss research network of clinical paediatric hubs. SwissPed-Registry provides expertise and advice for the development and conduct of epidemiological or clinical registries collecting data on children or persons of any age

Swiss Rare Disease Registry (SRDR): The SRDR is a national, population-based registry for children and adults with rare diseases. The overall aim of the SRDR is the collection of basic data on all people with rare diseases in Switzerland, the constitution of a platform for clinical and epidemiological studies, and the facilitation and documentation of patient participation in national and international trials.

Swiss Registry for Neuromuscular Disorders (Swiss-Reg-NMD): The Swiss-Reg-NMD is a national registry that includes children and adults diagnosed with Duchenne-Becker muscular dystrophy or spinal muscular atrophy (SMA). Aims of the registry are the inclusion of patients in current clinical trials and the long-term follow-up of patients with these disorders. The Swiss-Reg-NMD has completed a detailed report for the Federal Social Insurance Office (FSIO) by the end of October 2019, which provides information for assessing the effectiveness of Nusinersen in treating SMA patients.

Swiss Cerebral Palsy Registry (Swiss-CP-Reg): The Swiss-CP-Reg is a national registry that investigates health-related issues in people with cerebral palsy. It includes all children, adolescents and adults who are diagnosed with cerebral palsy. The aim is to improve the future care and well-being of individuals with CP.

Swiss Growth Study (SGS): The SGS is a national registry that evaluates efficacy and long-term effects of growth hormone treatment in Switzerland. The SGS contributes to understanding long-term effects of growth hormone treatment and helps to improve treatment quality and service planning.

Swiss Pediatric Renal Registry (SPRR): The SPRR is a national registry for children with end-stage renal disease. The set-up of the registry was launched in autumn 2019. The SPRR collects data to enable research on the underlying diseases, comorbidities, current treatments, measurements, long-term follow-up and quality of life.



Swiss Primary Ciliary Dyskinesia Registry (CH-PCD): The CH-PCD is a national registry that records patients of any age, suffering from PCD, who are treated and resident in Switzerland. The aim of the registry is to study prevalence and severity of patient-reported symptoms and health-related behaviours of PCD patients in Switzerland.

SwissPedData: The SwissPedData project aims to harmonize the collection of health related data in paediatric hospitals throughout Switzerland. This effort leads to a large increase in quality and quantity of standardized clinical data available to researchers and places Switzerland at the forefront of paediatric research. This standardization of clinical data will also greatly improve the quality of registry data.

Child & Adolescent Health (CAH) Research Group		
Claudia Kuehni Katharina Flandera (Assistant)		
Pediatric Registries Head: Claudia Kuehni		
SwissPedRegistry Head: Claudia Kuehni Coordinators: - Lilianna Bolliger (until 07/2019)	Swiss-CP-Reg A. Tschertter	Swiss PCD Registry M. Goutaki
	Swiss-Reg-NMD D. Baumann M. Kruijschaar	Swiss Rare Disease Registry G. Loss
	Swiss Pediatric Renal Registry C. Kuehni	Swiss Pediatric Airway Cohort C. Ardura
	Swiss Growth Registry G. Sommer	New registries joining
Paediatric Project Harmonizing Pediatric Data in Swiss hospitals (SPHN Project) C. Kuehni & B. Spycher (lead), M. Rakic, M. Jaboyedoff (until 04/2019)		

Key academic activities

Organization of conferences: Organization of Symposium “Clinical data for paediatric research: the Swiss approach” in Bern, Switzerland (5+6 Dec 2019)

Teaching: Regular teaching with lectures and tutoring in undergraduate and postgraduate students (University of Bern, MPH program) by Claudia Kuehni and Ben Spycher.

Grants

Universität Zürich, Abteilung für Stoffwechselkrankheiten, Kinderspital Zürich: Aufbau Schweizer Register für seltene Krankheiten (SRDR) (CHF 332'000; 07/2020-12/2020; PI: Claudia Kuehni)

SwissPedNet: SwissPedRegistry as research platform for paediatric registries (CHF 284'000; 1/2017–12/2020; PI: Claudia Kuehni)

Swiss Personalized Health Network (SPHN 2017DEV14): Harmonizing the collection of health related data and bio-specimens in paediatric hospitals throughout Switzerland (CHF 400'000; 06/2018–05/2020; PI: Claudia Kuehni).

Schweizerische Stiftung für das Cerebral gelähmte Kind: Swiss Cerebral Palsy Registry: (CHF 200'000; 8/2016–7/2019; PI: Claudia Kuehni)

Anna Mueller Grocholski-Stiftung: Swiss Cerebral Palsy Registry. (CHF 120'000; 8/2016–7/2019; PI: Claudia Kuehni)

Environmental and Spatial Epidemiology

The main objective of the Environmental and Spatial Epidemiology Group is to investigate the effects of environmental exposures on human health with a focus on childhood cancer. The group also investigates spatial and spatiotemporal variation of disease, particularly cancer.

Key scientific activities

The Environmental and Spatial Epidemiology Group investigated associations between childhood cancer risk and exposure to natural background ionising radiation, traffic-related air pollution, and parental occupational exposure to pesticides. The group also conducted a nationwide survey of children's exposure to ionising radiation. The survey included dosimetric measurements of exposure to background ionising radiation and UV radiation. Additional activities included the development of a new map of terrestrial gamma radiation in Switzerland, a simulation study comparing methods for spatial mapping, and the application of these methods to childhood cancer in Switzerland.

Key academic activities

Lectures in environmental epidemiology and the health effects of non-ionizing radiation (first-year medical students), review of biostatistics and epidemiology (fifth-year medical students), a five-day course on applied logistic regression jointly given with Prof. Stanley Lemeshow (SSPH+).

Grants

Ongoing:
Swiss National Science Foundation (320030_176218). Low dose ionising radiation and the risk of childhood cancer. Ben Spycher (PI), 1/2018 – 12/2021, CHF 572,000.

Swiss Cancer Research (KLS-4592-08-2018). Residential and occupational exposure to UV radiation and haematological malignancies. Ben Spycher (PI), 1/2019-12/2021; CHF 336,250.

New:
Swiss National Science Foundation (Spark grant: CRSK-3_190801). Better Science Through SIMulation (BESTSIM): A tool for simulating scientific discovery. Ben Spycher (PI); 3/2020-2/2021; CHF 99,915.

Fondation ARC pour la recherche sur le cancer. Postdoctoral fellowship. Lifetime exposure to agricultural pesticides and risk of testicular germ cells tumors, the TESTIS study. Astrid Coste, 7/2020-7/2022; Euro 120,000.

Medical Research Council (MRC Fellowship: MR/T025352/1). Evaluating the burden of climate-related respiratory disease using high resolution spatiotemporal models. Garyfallos Konstantinoudis, 10/2019-9/2022; £172,561.

Internal and external collaborations

Internal:
Swiss National Cohort (SNC), Swiss Childhood Cancer Registry (SCCR), Child and Adolescent Health Group, SwissRDL - Medical Registries and Data Linkage.

External:
Unisanté, Université de Lausanne (Prof. David Vernez, Dr. Aurélie Berthet,

Swiss Federal Office of Health (FOPH): Conceptualization of the Swiss Rare Disease Registry (CHF 118'390; 11/2016–6/2018; PI: Claudia Kuehni)

The Swiss-Reg-NMD secured funding for the next two years (significant contributions from patient organisations and Sponserd Research Agreement with a pharmaceutical company's).

Internal and external collaborations

Representatives of the Paediatric and Rare Diseases Registries Group attended national and international meetings with relevant stakeholders, participated in working groups, developed instruments, and represented the needs and interests of paediatric registries. It collaborates closely with Swiss RDL – the medical Registries and Data Linkage centre at the ISPM Bern – in particular for data linkage and software development.

Key team members

Claudia Kuehni (group leader, head of SwissPedRegistry, PI, SwissPedData), Ben Spycher (Co-PI SwissPedData), Anne Tschertter (senior researcher, project lead Swiss-CP-Reg and Swiss-Reg-NMD), Dominique Baumann (project coordinator Swiss-Reg-NMD), Michelle Elisabeth Kruijshaar (project coordinator Swiss-Reg-NMD), Lilianna Bolliger (project coordinator, SwissPedRegistry), Georg Loss (Project coordinator, Swiss Rare Disease Registry), Grit Sommer (project coordinator Swiss Growth Registry), Myrofora Goutaki (senior researcher, project coordinator Swiss PCD Registry, Milenko Rakic (postdoc, project coordinator SwissPedData), Nadine Lötscher (Data manager Swiss-Reg-NMD), Katharina Flandera (assistant)

Selected publications

Goutaki M, Eich M, Halbeisen FS, Barben J, Casaulta C, Clarenbach C, Hafen G, Latzin P, Regamey N, Lazor R, Tschanz S, Zanolari M, Maurer E, Kuehni CE. **The Swiss Primary Ciliary Dyskinesia registry: objectives, methods and first results.** Swiss Med Wkly. 2019 Jan 13;149. pii: w20004.

Swerdlow, Anthony J; Cooke, Rosie; Beckers, Dominique; Butler, Gary; Carel, Jean-Claude; Cianfarani, Stefano; Clayton, Peter; Coste, Joël; Deodati, Annalisa; Ecosse, Emmanuel; Hokken-Koelega, Anita C S; Khan, Aysha J; Kiess, Wieland; Kuehni, Claudia E; Flück Pandey, Christa Emma; Pfaffle, Roland; Säwendahl, Lars; Sommer, Grit; Thomas, Muriel; Tidblad, Anders; ... (2019). **Risk of meningioma in European patients treated with growth hormone in childhood: results from the SAGhE cohort.** Journal of clinical endocrinology and metabolism, 104(3), pp. 658-664. Endocrine Society 10.1210/jc.2018-01133

PD Dr. Jean Luc Bulliard), Swiss TPH (Prof. Martin Röösli), University of Tampere (Prof. Anssi Auvinen), French National Institute of Health and Medical Research (INSERM) (Prof. Jacqueline Clavel, Prof. Denis Hémon), Danish Cancer Society Research Center (Prof. Ole Raaschou-Nielsen), UCLA Fielding School of Public Health (Prof. Leekha Kheifets), Swiss Paediatric Oncology Group (SPOG), Swiss Federal Nuclear Safety Inspectorate (ENSI) (Dr. Benno Bucher), Paul Scherrer Institute (PSI) (Dr. Eduardo Yukihara), Federal Office of Public Health (FOPH) (Philipp Steinmann, Martha Palacios), Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA) (Dr. Marc Wittlich).

Key team members

Ben Spycher (group leader), Christian Kreis (postdoc), Astrid Coste (postdoc), Garyfallos Konstantinoudis (PhD student), Antonella Mazzei (PhD student), Christophe Folly (PhD student), Selma Riedo (research assistant), Jimena Sobrino (research assistant)

Terrestrial Ratiation [nSv/h]

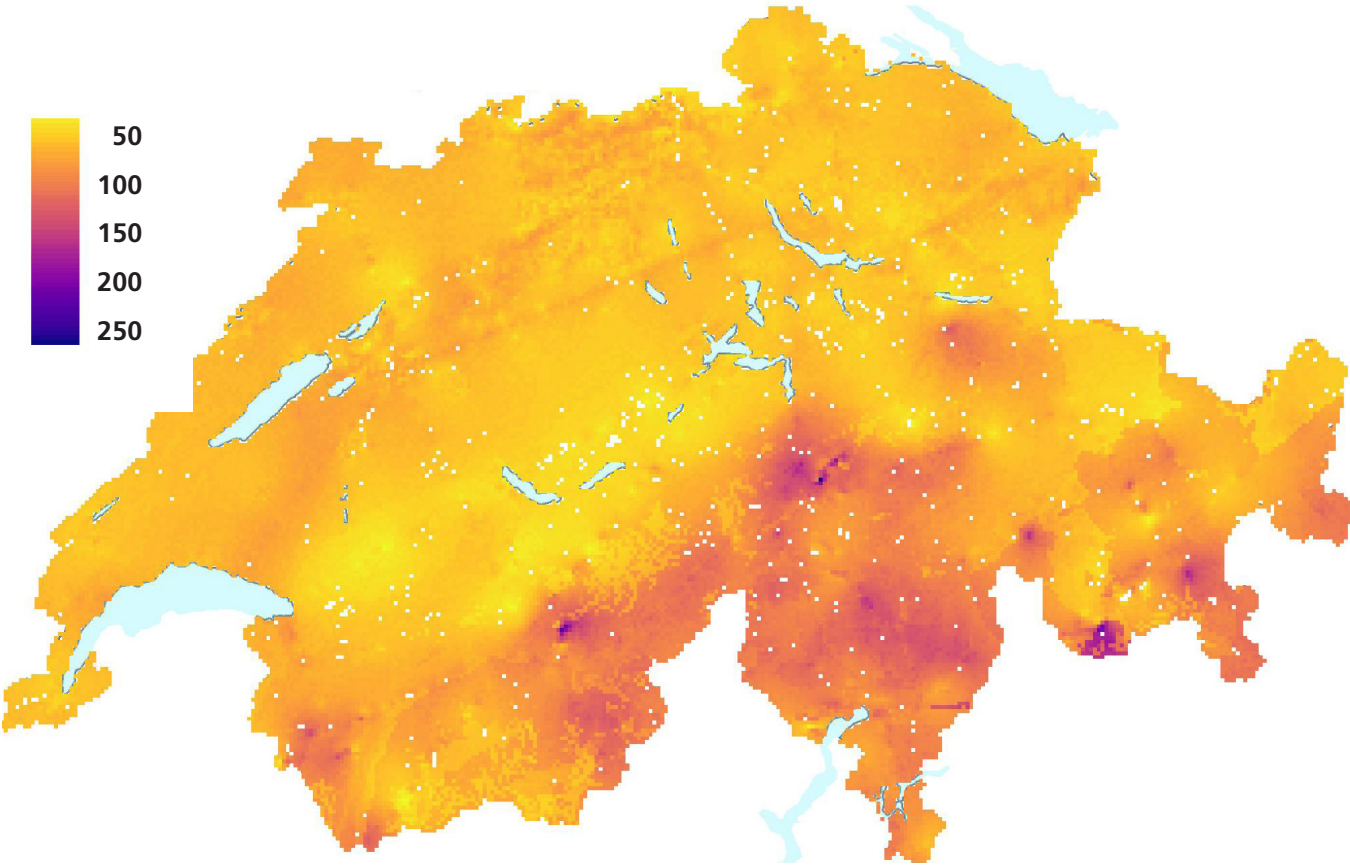


Figure 1:
Map of terrestrial gamma radiation in Switzerland. The plotted values are modelled ambient dose rates in nSv/h.

Selected publications

Mazzei-Abba A, Folly CL, Coste A, Wakeford R, Little MP, Raaschou-Nielsen O, Kendall G, Hémon D, Nikkilä A, Spix C, Auvinen A, Spycher BD. **Epidemiological studies of natural sources of radiation and childhood cancer: current challenges and future perspectives.** J Radiol Prot. 2019; 40(1):R1-R23. doi: 10.1088/1361-6498/ab5a38. [Epub ahead of print]

Konstantinoudis G, Schuhmacher D, Rue H, Spycher BD. **Discrete versus continuous domain models for disease mapping.** Spat Spatiotemporal Epidemiol. 2020 Feb; 32:100319. doi: 10.1016/j.sste.2019.100319. Epub 2019

Kreis C, Doessegger E, Lupatsch JE, Spycher BD. **Space-time clustering of childhood cancers: a systematic review and pooled analysis.** Eur J Epidemiol 2019; 34(1): 9-21. doi: 10.1007/s10654-018-0456-y.

Sommer G, Schindler M, Redmond S, Pfeiffer V, Konstantinoudis G, Ammann RA, Ansari M, Hengartner H, Michel G, Kuehni CE. **Temporal trends of childhood cancers in Switzerland.** Cancer Epidemiology; 2019; 61:157-64. <https://doi.org/10.1016/j.canep.2019.06.002>.

Konstantinoudis, G., Schuhmacher, D., Ammann, R., Diesch, T., Kuehni, C., & Spycher, B. D. **Bayesian spatial modelling of childhood cancer incidence in Switzerland using exact point data: A nationwide study during 1985-2015.** medRxiv, 19001545. <https://doi.org/10.1101/19001545>.

Evidence Synthesis Research

- *Development of methodology for evidence synthesis with emphasis on statistical modelling.*
- *Development of online tools to facilitate interpretation of evidence and medical decision making process.*

Key scientific activities

We continue to develop the online software **CINeMA, Confidence in Network Meta-analysis** (by Theodoros Papakonstantinou): cinema.ispm.unibe.ch.

As part of an **SNF Ambizione grant "Predicting the real-world effectiveness and safety of medical interventions"**, Orestis Efthimiou and Michael Seo evaluated methods for model selection in individual patient meta-analysis. Within the same project, they applied machine learning methods to predict depression scores using data from a pragmatic megatrial in depression (online tool: <https://cinema.ispm.unibe.ch/shinies/sund/>).

As part of a **European Horizon 2020 project (HTx)**, <https://www.htx-h2020.eu> Tasnim Hamza and Georgia Salanti develop Bayesian methodology for dose-response meta-analysis.

Within the same **project, HTx**, Konstantina Chalkou and Georgia Salanti have developed a model that combines individual patient meta-analysis and prognostic modelling to make personalised predictions for patients with relapsing-remitting multiple sclerosis under various treatment options. See the online tool <https://cinema.ispm.unibe.ch/shinies/koms/>.

Funded by the **SNSF project "What works best? Methods for ranking competing treatments in network meta-analysis"**, Virginia Chiocchia, Adriani Nikolakopoulou, and Georgia Salanti investigate various aspects of the methodology to rank many competing treatments; they approach the issue theoretically and empirically, and expand on existing ranking metrics.

We contribute to the open access software by publishing libraries in R such as `nma`, a network meta-analysis database API available from <https://CRAN.R-project.org/package=nma>, and `nma_contribution`, an R package by Theodoros Papakonstantinou to calculate contribution of studies in network meta-analysis, available from: <https://github.com/tpapak/nma-contribution>.

Key academic activities

We participated in various teaching events. Members of our team teach regularly in international events such as the Swiss Epidemiology Winter School in Wengen, the Course on Network Meta-Analysis in Oxford, and in-house CAS and SSPH+ teaching events on prognostic modelling and meta-analysis.

Emphasis was given to the dissemination of the CINeMA framework, such as the Cochrane Training Webinar for CINeMA. Virginia Chiocchia presented the lecture "Evaluating the confidence in network meta-analysis" for the course on meta-Analysis at the University of Zurich 14 February 2020.

We participated in several national and international conferences to present our work, such as the XXXIst Conference of the Austro-Swiss Region of the International Biometric Society in Lausanne (with a total of four oral presentations) and the DAGStat Conference 2019 in Munich (with a total of three oral presentations and one poster).

The PhD students participated in the 11th Symposium of the Graduate School for Health Sciences (GHS), 19-20 November 2019. A total of four posters were presented; Virginia Chiocchia was awarded the Prize for Best Poster.

Orestis Efthimiou is enrolled for a habilitation and has been contributing to undergraduate teaching events.

Adriani Nikolakopoulou participated in the COMET Career Programme, and coedits a special issue for Data Visualization in Research Synthesis Methods.

Our team hosted the General Assembly of the HTx project.

Georgia Salanti participates in and contributes to EUNetHTA joint Action 3.

Grants

Our work is primarily funded by:
The **European Union's Horizon 2020** research and innovation programme under grant agreement No. 825162 (HTx project <https://www.htx-h2020.eu>)

Swiss National Science Foundation, projects grant/award number 179158.

Ambizione grant No. 180083 from the Swiss National Science Foundation (SNSF)

We received smaller research grants from **The Cochrane Collaboration**, NIHR (in collaboration with Imperial College), Deutsche Forschungsgemeinschaft (in collaboration with Technische Universität Munchen).

Georgia Salanti received an International Fellowship for Research from the **Japan Society for Promotion of Science** (in collaboration with University of Kyoto).

Adriani Nikolakopoulou received a postdoctoral Mobility fellowship from the **Swiss National Science Foundation** to undertake research on the role of placebo effect in the results of evidence synthesis at the Institute of Medical Biometry and Statistics (IMBI) at the Medical Center – University of Freiburg.

Internal and external collaborations

We collaborate extensively with the departments of psychiatry at the University of Oxford, the Technical University of Munich, the Kyoto University School of Public Health, and King's College London to perform research on mental health issues.

We also collaborate with:
York University, Leiden University, Utrecht University and ZIN (the Dutch HTA agency) as part of the HTx project

University College London and the University of Ioannina for the SNSF Project "What works best? Methods for ranking competing treatments in network meta-analysis" and the project "Predicting the real-world effectiveness and safety of medical interventions".

The Department of Cardiology, Bern University Hospital, Inselspital S and the Department of Advanced Biomedical Sciences, University of Naples to perform research on evidence-based cardiology

The Institute of Reproductive and Developmental Biology, Department of Surgery & Cancer, Faculty of Medicine, Imperial College London to perform research in oncology.

Biogen to perform research in relapsing remitting multiple sclerosis.

Is this Atlas???



Health Services Research

To study health care delivery systems of Switzerland and abroad to provide evidence on the quality, costs, and use of health care, and show how resources should be rationally distributed to fit patient needs.

Key scientific activities

Documenting regional variation of health care, health care delivery interventions, social determinants of health, and interprofessional collaboration

Key academic activities

Research, teaching, consultancy (Thomas), service (Marcel) in the review panels for the NFP 74 Smarter Health Care (www.nfp74.ch), president of the evaluation panel of the Krebsforschung Schweiz Programme Health Services Research in Oncology and Cancer Care, and president/Chair of the Swiss Expert Panel on Cancer Screening (<https://cancerscreeningcommittee.ch/>)

Grants

NFP74 (01.04.2017-31.08.2020) Migrant Women's Health Care Needs for Chronic Illness Services in Switzerland (MIWOCA) MIWOCA (<http://p3.snf.ch/project-167428>) (485'879.00)

FMH (01.01.2017-31.12.2019) Stützung des Forschungsschwerpunktes Versorgungsforschung am ISPM der Universität Bern (CHF 225'000)

Internal and external collaborations

BAG, CTU, BIHAM, University hospital Inselspital (palliative care, cardiology), Obsan, SAKK, FMH

Key team members

Thomas Abel, Claudia Berlin, Maud Maessen, Nicole Steck, Marcel Zwahlen

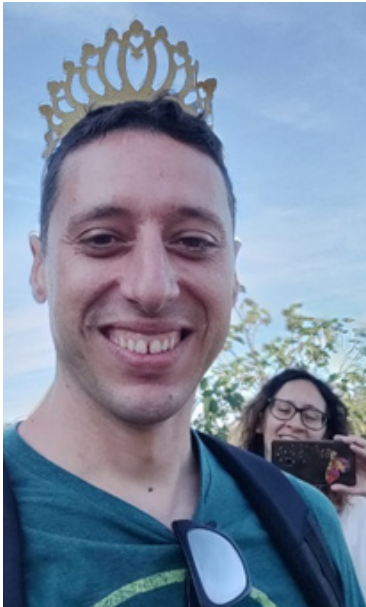
Selected publications

White N, Oostendorp L, 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 thresholds for triggering a negative response to the “Surprise Question”: a study protocol**, BMC Palliat Care. 2019 Apr 9;18(1):36. doi: 10.1186/s12904-019-0413-x

Steck N, Hostettler S, Kraft E, Berlin C, Spoerri A, Zwahlen M: **Register in Versorgungsforschung und Qualitätssicherung**. Schweizerische Ärztezeitung 2019, 100:108–12. [Wacker J, Zwahlen M: Uncertain progress in Swiss perioperative mortality 1998-2014 for 22 operation groups. Swiss Med Wkly 2019, 149:w20034.

Zurcher K, Zwahlen M, Berlin C, Egger M, Fenner L: **Trends in influenza vaccination uptake in Switzerland: Swiss Health Survey 2007 and 2012**. Swiss Med Wkly 2019, 149:w14705.

Keel I, Schürch R, Weiss J, Zwahlen M, Immer FF, **Comité National du Don d’Organes: Is there an association between consent rates in Swiss hospitals and critical care staffs' attitudes towards organ donation, their knowledge and confidence in the donation process?** PLOS ONE 2019, 14:e0211614.



Not sure whether the Autumn outing prize is a scientific rather than an academic achievement.



The PhD students in a conference break

Key team members

Konstantina Chalkou, Virginia Chiocchia, Orestis Efthimiou, Matthias Egger, Tasnim Hamza, Adriani Nikolakopoulou, Theodoros Papakonstantinou, Georgia Salanti Michael Seo

Selected publications

O Efthimiou, G Rücker, G Schwarzer, JPT Higgins, M Egger, G Salanti. **Network meta-analysis of rare events using the Mantel-Haenszel method**. Statistics in Medicine, 2019.

Nikolakopoulou A, Trelle S, Sutton AJ, Egger M, Salanti G. **Synthesizing evidence to design future trials: survey of methodologists in Europe**. Trials. 2019 Jun.

White IR, Turner RM, Karahalios A, Salanti G. **A comparison of arm-based and contrast-based models for network meta-analysis**. Stat Med. 2019 Nov 30; 38(27):5197-5213. doi: 10.1002/sim.8360.

Furukawa TA, Cipriani A, Cowen PJ, Leucht S, Egger M, Salanti G. **Optimal dose of selective serotonin reuptake inhibitors, venlafaxine, and mirtazapine in major depression: a systematic review and dose-response meta-analysis**. Lancet Psychiatry. 2019 Jul;6(7):601-609. doi: 10.1016/S2215-0366(19)30217-2.

Efthimiou, O, White, Ian R.. **The dark side of the force: Multiplicity issues in network meta-analysis and how to address them**. Res Syn Meth. 2020; 11: 105–122. <https://doi.org/10.1002/jrsm.1377>

HIV, Hepatitis and Tuberculosis

We study the clinical and public health epidemiology of HIV and coinfections with hepatitis B/C and tuberculosis in sub-Saharan Africa. Our main focus is on the epidemiology of HIV and coinfections, long-term outcomes of antiretroviral therapy (ART), the impact of ART on HIV transmission and coinfections, mathematical modelling, and methodological aspects of the analysis of longitudinal data.

Key scientific activities

We conduct analyses for international organizations such as UNAIDS, the Clinton Health Access Initiative, the World Health Organization, the Gates Foundation, UNITAID, the World Bank, and other external partners. We also collaborate closely with international partners as well as ISPM's own research groups.

Key academic activities

International epidemiology Database to Evaluate AIDS (IeDEA) All Africa meeting and IeDEA Southern Africa Steering Group meeting, Johannesburg, South Africa: scientific presentations with a focus on contributions by young investigators on HIV, coinfections and comorbidities, health system and service response. Workshops on scientific paper writing, grant application and writing, and data analysis. R statistical software (Bern, Lausanne). Scientific lectures, ISPM.

Grants

National Institute of Allergy and Infectious Diseases (NIAID), U01AI069924 (2016-2021): International Epidemiology Databases to Evaluate AIDS - Southern Africa (IeDEA-SA), (\$14.000.000, PI Egger)

Internal and external collaborations

ISPM research groups:
Cancer, Sexual and Reproductive Health, Climate Change and Health

External:
Clinical Trials Unit, University of Bern; Center for Development and Environment, University of Bern; University of Geneva; University of Zürich; Swiss TPH; Swiss School of Public Health (SSPH+); International epidemiology Database to Evaluate AIDS network; World Health Organization

Key team members

Matthias Egger (group leader), Nanina Anderegg (statistician), Marie Ballif (postdoctoral research fellow), Simon Bertschinger (research assistant), Felix Cuneo (research fellow), Cam Ha Dao Ostinelli (clinical data manager), Carole Dupont (scientific and administrative assistant), Lukas Fenner (senior research scientist), Andreas Haas (senior research scientist), Anthony Hauser (PhD student), Catrina Mugglin (PhD student), Martina Reichmuth (research fellow), Julien Riou (postdoctoral research fellow), Lilian Smith-Wirth (project assistant), Per von Groote (program manager IeDEA SA), Gilles Wandeler (clinical research fellow), Elizabeth Zaniewski (project manager/ epidemiologist IeDEA-WHO Collaboration), Kathrin Zürcher (research assistant), Marcel Zwahlen (deputy director).

Selected publications

Anthony Hauser, Katharina Kusejko, Leigh F. Johnson, Gilles Wandeler, Julien Riou, Fardo Goldstein, Matthias Egger, Roger D. Kouyos (2019). **Bridging the gap between HIV epidemiology and antiretroviral resistance evolution: Modelling the spread of resistance in South Africa**, PLOS Computational Biology 15(6), Rodolphe Thiebaut (ed.), p. e1007083. doi:10.1371/journal.pcbi.1007083

Andreas D Haas, Leigh F Johnson, Anna Grimsrud, Nathan Ford, Catarina Mugglin, Matthew P Fox, Jonathan Euvrard, Monique van Lettow, Hans Prozesky, Izukanji Sikazwe, Cleophas Chimbetete, Michael Hobbins, Cordelia Kunzekwenyika, Matthias Egger, for IeDEA Southern Africa (2019). **Extending Visit Intervals for Clinically Stable Patients on Antiretroviral Therapy: Multicohort Analysis of HIV Programs in Southern Africa.**, Journal of acquired immune deficiency syndromes (1999) 81(4), p. 439-447. doi:10.1097/QAI.0000000000002060

Eliane Rohner, Lukas Bütikofer, Kurt Schmidlin, et al. (2019). **Cervical cancer risk in women living with HIV across four continents: A multicohort study**, International Journal of Cancer. doi:10.1002/ijc.32260

Kathrin Zürcher, Marie Ballif, Lukas Fenner, et al. (2019). **Drug susceptibility testing and mortality in patients treated for tuberculosis in high-burden countries: a multicentre cohort study**, Lancet Infectious Diseases (2019). doi:10.1016/S1473-3099(18)30673-X [Swiss TB Award 2019]

Belinda V Chihota, Gilles Wandeler, Roma Chilengi, Lloyd Mulenga, Raymond T Chung, Debika Bhattacharya, Mathias Egger, Michael J Vinikoor (2019). **High Rates of Hepatitis B Virus (HBV) Functional Cure Among Human Immunodeficiency Virus-HBV Coinfected Patients on Antiretroviral Therapy in Zambia**. The Journal of Infectious Diseases. doi:10.1093/infdis/jiz450

Participants at the 3rd IeDEA All Africa meeting, Johannesburg, 30-31 October 2019.



Immuno-Epidemiology

Our research concerns how the population biology of infectious diseases is affected by environmental changes, dynamic patterns of host immunity, and public health interventions. We use mathematical and computational modelling in combination with data analyses to obtain a better understanding of the interactions between pathogens, their hosts, and the environment. This creates unique insights into the ecological and evolutionary principles of infectious disease dynamics, and is of great relevance for improving public health.

Key scientific activities

- Organization of workshop on Infectious Disease Surveillance at ISPM.
- Invited presentation at the STI & HIV 2019 World Congress in Vancouver, Canada.
- Scientific paper on seasonal influenza transmission Switzerland (ref. 2).

Key academic activities

Maurane Riesen defended her PhD thesis on "Human papillomavirus vaccination in Switzerland: uptake heterogeneity, impact and costs" in January 2020.

We continued our teaching activities at the University of Bern and the University of Zurich.

Grants

SNMF (06/2020-05/2022): Tracking the COVID-19 epidemic in Switzerland: phylogenetics and epidemiological modeling (#196046) (CHF 295'487, co-applicant Richard Neher, University of Basel)

Horizon 2020 (03/2020-03/2023): EpiPose - Epidemic intelligence to minimize 2019-nCoV's public health, economic and social impact in Europe (#101003688) (CHF 534'450, co-applicant Nicola Low)

Internal and external collaborations

We continued our successful collaboration with the research group of Nicola Low (Sexual and Reproductive Health) on mathematical modeling studies. We also collaborated with colleagues in the UK on LUSTRUM (<https://www.lustrum.org.uk>).

Key team members

Christian L. Althaus (head of research group),
Maurane Riesen (PhD student until January 2020)

Selected publications

Counotte MJ, Althaus CL, Low N, Riou J. **Impact of age-specific immunity on the timing and burden of the next Zika virus outbreak.** PLoS Negl Trop Dis. 2019 Dec 26; 13(12):e0007978.

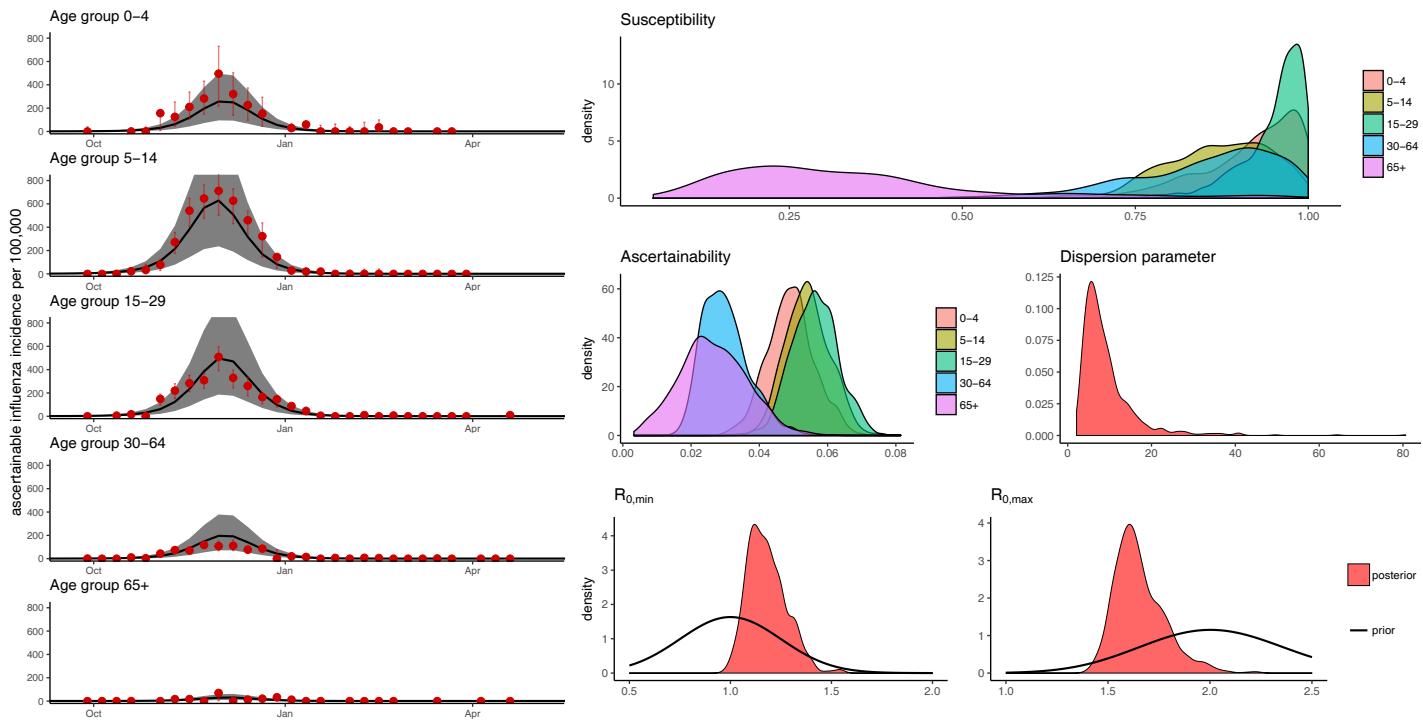
Brugger J, Althaus CL. **Transmission of and susceptibility to seasonal influenza in Switzerland from 2003 to 2015.** Epidemics. 2020 Mar;30:100373.

Smid J, Althaus CL, Low N, Unemo M, Herrmann B. **Rise and fall of the new variant of Chlamydia trachomatis in Sweden: mathematical modelling study.** Sex Transm Infect. 2019 Oct 5.

Smid J, Althaus CL, Low N. **Discrepancies between observed data and predictions from mathematical modelling of the impact of screening interventions on Chlamydia trachomatis prevalence.** Sci Rep. 2019 May 17;9(1):7547.

Porgo TV, Norris SL, Salanti G, Johnson LF, Simpson JA, Low N, Egger M, Althaus CL. **The use of mathematical modelling studies for evidence synthesis and guideline development: A glossary.** Res Synth Methods. 2019 Mar;10(1):125-133.

Dynamics of the influenza epidemic in Switzerland during the season 2009/2010 (from Brugger & Althaus)



Musculoskeletal Health and Rheumatology

The Musculoskeletal Health and Rheumatology Group is involved in research projects on musculoskeletal disorders, especially osteoarthritis and giant cell arteritis. This includes studies of prevalence, incidence, diagnosis and natural history, as well as systematic reviews and randomized controlled trials. The group collaborates with the Clinic for Rheumatology, Immunology and Allergology of the University Hospital Bern.

Key scientific activities

We are performing a 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. All original 1080 participants will be mailed a validated self-report questionnaire focusing on the development of hip pain and any surgical procedures performed during the previous 10 years. All participants initially evaluated with MRI will be asked to undergo repeat clinical examination and MRI.

We are evaluating the morphological changes on hip X-ray within the framework of a multicentre randomised controlled trial comparing arthroscopic hip surgery to physiotherapy-led care for femoro-acetabular impingement: the Australian FASHIoN trial.

We are performing additional analysis of gait variables in the BIOTOK randomized clinical trial (the effects of biomechanical vs. sham footwear on osteoarthritis knee pain).

We are conducting a clinical trial of rapid induction of remission with high-dose glucocorticoids in patients with giant cell arteritis (GUSTO trial).

We are establishing a register of patients with giant cell arteritis at the University Hospital Bern and within the Swiss Clinical Quality Management in Rheumatic Diseases Registry.

Key academic activities

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

Grants

Swiss National Science Foundation 32473B_160153 (CHF 429'000)

Internal and external collaborations

University Hospital of Bern (Inselspital)
Swiss Institute for Translational and Entrepreneurial Medicine in Bern (sitem-insel AG)
University of Bern, CTU Bern
University of Toronto, Toronto, Canada (Prof. Peter Jüni)
University of Sydney, Sydney, Australia (Prof. David Hunter)
Boston University, Boston, Massachusetts, USA (Prof. David Felson)

Key team members

Prof. Dr. med. Stephan Reichenbach, Roger Hilfiker, Christian Bangerter, Zina Heg-Bachar

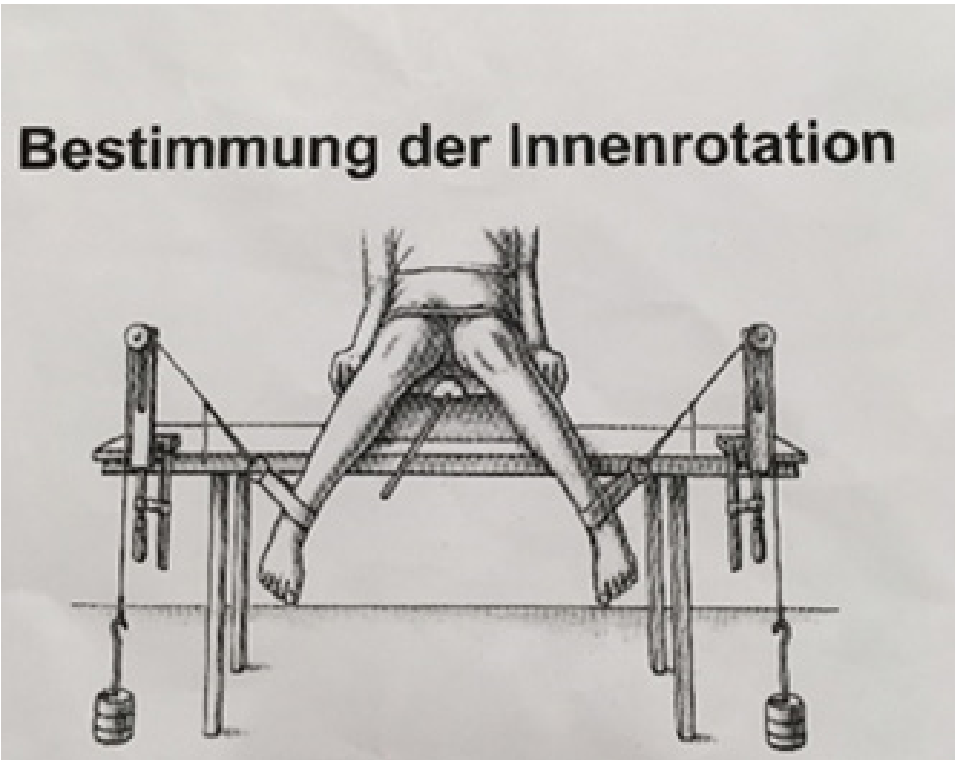
Selected publications

Bieri M, Beck M, Limacher A, Wyatt MC, Leunig M, Jüni P, Reichenbach S. **Increased subchondral bone thickness in hips with cam-type femoroacetabular impingement.** Hip Int. 2019 Jul;29(4):430-437. doi: 10.1177/1120700018808996

Adler S, Reichenbach S, Gloor A, Yerly D, Cullmann JL, Villiger PM. **Risk of relapse after discontinuation of tocilizumab therapy in giant cell arteritis.** Rheumatology (Oxford). 2019 Sep 1;58(9):1639-1643



Figure 1-2:
Examination chair to assess hip internal rotation.



Palliative Care and End of Life

Innovative contributions to care and service development of palliative care

Key scientific activities

Advance care planning; best care for the dying patient; community palliative care

Key academic activities

Research, internal and external teaching, expert activities: research evaluation and assessment, board members, scientific committees of conferences

Grants

Horizon 2020 (01/2019-01/2023): I-LIVE: Living well, dying well. A research programme to support living until the end (Grant agreement no: 825731) (Total EUR 4'017.817,50 of which Bern EUR 394.750, Eychmüller and Zambrano)

Swiss National Science Foundation (02/2018-07/2022): PROAKTIV: A cluster trial of palliative needs assessment and care in general practice (SNF 407440_167501) (CHF 559'431, Maessen, Eychmüller)

Swiss National Science Foundation (04/2017-03/2020): Determinants of End of Life discussions in Non-Malignant Illness: An International, Multicentre, Qualitative Study to Understand the Key Perspectives of Bereaved Families and Medical Specialists (10001C_169887/1) (CHF 57'602, Zambrano, Eychmüller)

Swiss Cancer Research (11/2016 - 04/2019): SENS Economics; Is early palliative care associated with a reduction in intensity and costs of care at the end of life in patients with advanced cancer? A randomised trial (KFS-3725-08-2015) (CHF 192'600, Maessen, Eychmüller)

Swiss Cancer Research (04/2019-04/2021): Communication with cancer patients and their families about approaching death: Scaffolding conceptual and practical learning for health professionals. (CHF 374'964, Eychmüller, Zambrano, Lead: Güttormsen, S.)

Federal Office of Public Health (12/2017-10/2019): Die Bedürfnisse von Angehörigen in der End-of-Life-Phase der Betreuung. Forschungsmandat: pflegende Angehörige in der End-of-Life-Phase. (CHF 60'059, Zambrano, Eychmüller)

Gesundheitsförderung Schweiz, (1/2020 - 31.12.2022): Projekt «Co-Lab» Compassionate city (Total CHF 300.000 of which CHF 125.000 for PCEOL-research group, (Eychmüller, Lead: Dr. Claudia Michel).

CTU-Grant Inselspital (9/2019 – 08/2021): Development of a prognostic model for identifying critically ill patients in need of PC using electronic health record-based triggers ("e-triggers"); (CHF 78'586, Eychmüller, Lead: Lüthi)

Internal and external collaborations

Rotterdam (+12 countries including Argentina and New Zealand) in iLIVE (Horizon 2020); Brisbane, San Francisco (SNF); Geneva, Zurich

Key team members

Steffen Eychmüller, Maud Maessen, Sofia Zambrano, Nora Lüthi, Monica Fliedner, Barbara Affolter

Selected publications

Fliedner M, Zambrano S, Lohrmann C, Schols J, Halfens R, Eychmueller S. **An early palliative care intervention can be confronting but reassuring: A qualitative study on the experiences of patients with advanced cancer.** Palliative Medicine, 2019, Volume: 33 issue: 7, page(s): 783-792. <https://journals.sagepub.com/doi/10.1177/0269216319847884>

Fliedner M, Mitchell G, Bueche D, Mettler M, Schols JMGA, Eychmueller S. **Development and use of the 'SENS-structure' to proactively identify care needs in early palliative care – an innovative approach.** Healthcare 2019, 7, 32. <https://doi:10.3390/healthcare7010032>

Zambrano, SC; Centeno, C, Larkin, P; Eychmüller, S. **Cross-sectional international survey: Palliative care researchers' and academics' perceptions and practices of using the term 'palliative care'.** Journal of Palliative Medicine 2019. <https://doi.org/10.1089/jpm.2019.0068>

Gaertner, J, Eychmueller, S, Leyhe, T, Bueche, D, Savaskan, E, Schlögl, M. **Benzodiazepines and/or neuroleptics for the treatment of delirium in palliative care? – a critical appraisal of recent randomized controlled trials.** Annals of palliative medicine, 2019;8(4):504-515. <http://dx.doi.org/10.21037/apm.2019.03.06>

Maessen M, Steck N, Zwahlen M, Eychmüller S. **Potenzielle ökonomische Auswirkungen von mobilen Palliativdiensten in der Schweiz.** https://www.plattform-palliativecare.ch/sites/default/files/page/files/181220_Schlussbericht_Report_PotentialCostsMPD_1.pdf



Sexual and Reproductive Health

The Sexual and Reproductive Health Research Group investigates sexually transmitted infections, reproductive tract infections, sexuality, sexual behaviour and practices, and contraception. We study the aetiology, epidemiology, prevention and control, diagnosis, and social and cultural aspects of sexual and reproductive health in Switzerland, Europe, and internationally. We also study the emergence of evidence of emerging infectious diseases that include nonsexually transmitted infections.

Key scientific activities

In 2019, the research group continued collaborations in two international randomised controlled trials: 1) the Women and Newborn Trial of Antenatal Interventions and Management (WANTAIM) in Papua New Guinea, investigating the effect of point-of-care screening and treatment for sexually transmitted infections in pregnancy on preterm birth, low birthweight, and neonatal infections; and 2) Limiting Undetected Sexually Transmitted infections to RedUce Morbidity (LUSTRUM), investigating the effect of accelerated partner therapy for chlamydia infections in the UK. We continued projects about the SExual health of Migrants And refugees (SELMA), trends in the use of diagnostic test modalities for Neisseria gonorrhoeae, Antimicrobial Resistant Gonorrhoea in Men who have sex with men (ARGon-M), thresholds for antimicrobial resistance in N. gonorrhoeae; Zika open science and the risks of emerging infectious diseases; and systematic reviews of sexually transmitted infection epidemiology. We were awarded a new project grant to study the global political prioritisation of the prevention and control of sexually transmitted infections.

Key academic activities

Lectures for medical students on public health ethics (year 1), gender and public health (year 1) global health (year 5), epidemiology of infectious diseases (year 5); seminar on health scares in the news. Three-day course on writing a scientific article and getting it published (SSPH+). Nicola Low is an expert member of Graduate School of Cellular and Biomedical Sciences and open access ambassador for the Swiss National Science Foundation. Michel Counotte submitted his PhD, Maurane Riesen defended her PhD, Carole Frenzer submitted her medical master’s thesis. Diana Buitrago-Garcia and Ranjana Gigi started their PhD studies.

Grants

Ongoing:
Europe and Global Challenges, 208712/Z/17/Z. Identifying and implementing appropriate and effective public policy responses for improving the sexual health of migrants and refugees. Co-applicant (PI Hawkes SJ), EUR 898'300. Nov 2017-Apr 2021.

Swiss National Science Foundation projects, 320030_176233. Zika virus: causality, open science and risks of emerging infectious diseases. PI CHF 700'000. Oct 2017-Sep 2021.

Gottfried und Julia Bangerter-Rhyner-Stiftung, 8472. The influence of case management on the burden of antibiotic resistant gonorrhoea: patient and provider perspectives. PI CHF 192'773. Sep 2016-June 2020.

Swiss National Science Foundation r4d project, IZ07Z0_160909/1. Improving neonatal and infant outcomes using point-of-care tests for STI in high prevalence settings. PI CHF 488'444. Mar 2016-Sep 2021.

UK DFID/MRC/Wellcome Trust Joint Global Health Trials, MRN006089/1. Point-of-care testing and treatment of STI to improve pregnancy outcomes in resource-limited, high burden settings. Co-applicant (PI Vallely A), GBP 3'295'866. Jan 2016-Dec 2020.

UK National Institute for Health Research, RP-PG-0614-20009. Improving the sexual health of heterosexual people and men who have sex with men by preventing transmission of STI and reducing undiagnosed HIV: a mixed methods programme of research. Co-investigator (PI Estcourt CE). GBP 2'471'487. Jan 2016-Dec 2020.

New:
Swiss Government Excellence Awards, PhD stipend 019.0774. The science of prevalence: development of an evidence-based tool to assess the risk of bias in prevalence studies (Diana Buitrago-Garcia) Sep 2019-Aug 2022.

Swiss Academy of Medical Sciences, MD-PhD stipend. Genital tract infections, the vaginal microbiome and preterm birth in South Africa: cross-sectional study (Ranjana Gigi) Nov 2019-Oct 2022.

Swiss Network of International Studies, 19/63. Political prioritisation of the prevention and control of sexually transmitted infections: A global challenge. (Nicola Low) Jan 2020-Dec 2021.

Internal and external collaborations

Internal:
University of Bern (Dr. Christine Bigler-Luhm).

External:
University College London (Prof. Sarah Hawkes); Weill-Cornell University Qatar (Prof. Laith Abu-Raddad); London School of Hygiene and Tropical Medicine (Assoc. Prof. Matthew Chico); Glasgow Caledonian University (Prof. Claudia Estcourt); Kirby Institute, University of New South Wales and Papua New Guinea Institute of Medical Research (Prof. Andrew Vallely; Assoc. Prof. Angela Kelly); Berner Fachhochschule (Dr. Eva Cignacco); World Health Organization (Dr. Nathalie Broutet; Dr. Melanie Taylor; Dr. Teodora Wi); Institute of Health Metrics and Evaluation (Dr. Mae Dirac); University of Basel (Assoc. Prof. Dunja Nicca).

Key team members

Nicola Low (research group lead), Diana Buitrago-Garcia (PhD student), Dianne Egli-Gany (senior scientific project manager, epidemiologist), Michel Counotte (PhD student), Carole Frenzer (Medical Masters student), Ranjana Gigi (MD-PhD student), Maurane Riesen (PhD student)

Selected publications

Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad L, Chico RM, Smolak A, Newman L, Gottlieb SL, Thwin SS, Broutet N, Taylor MM. **Global and Regional Estimates of the Prevalence and Incidence of Four Curable Sexually Transmitted Infections in 2016.** Bull World Health Org 2019; 97:548-562P.

Egli-Gany D, Spaar Zographos A, Diebold J, Masserey Spicher V, Frey Tirri B, Heusser R, Dillner J, Petignat P, Sahli R, Low N. **Human papillomavirus genotype distribution and socio-behavioural characteristics in women with cervical pre-cancer and cancer at the start of a human papillomavirus vaccination programme.** BMC Cancer 2019, 19:111.

Climate Change and Health

The research team focuses on assessing the impact of climate change and other related environmental stressors on health. In particular, their research interests include the quantification of current and future health impacts attributed to climate change and evaluation of public health measures as adaptation and mitigation strategies. The team is also interested in exploring the urban heat island effect and the specific role of urban features on the effect of heat on health. As more novel topics, the team aims to conduct studies to identify the potential etiological mechanisms explaining the association between temperature and specific health outcomes such as cardiovascular diseases and mental disorders. Finally, the team aims to build an innovative research line on the impact of changing environment on the elderly focusing in particular on the link between healthy aging and climate change.

Key scientific activities

Since September 2019 (when the team began work in Bern), we have started two parallel research lines as part of the PhD theses of Marvin Bundo and Evan de Schrijver. The former started conducting a study on the association between weather and hospitalizations due to mental disorders in Bern. The latter started working on a nationwide study of the temporal variation of heat- and cold-related mortality impacts in Switzerland. The team is also involved in other international collaborations as members of the Multi-Country Multi-City Collaborative Research Network (MCC).

Internal and external collaborations

Internal:
Environmental and Spatial Epidemiology Group

External:
Antonio Gasparrini (London School of Hygiene and Tropical Medicine), Kai Chen (Yale University), Thomas Müller (University of Bern), Jakob Zscheischler (University of Bern), Martina Ragettli (Swiss Tropical and Public Health Institute).

Key team members

Marvin Bundo, Evan de Schrijver, Ana Maria Vicedo-Cabrera

Left:
Ana Maria Vicedo-Cabrera
Group leader

Middle:
Marvin Bundo
PhD student

Right:
Evan de Schrijver
PhD student



Counotte M, Althaus CL, Low N, Riou J. **Impact of age-specific immunity on the timing and burden of the next Zika virus outbreak.** PLOS Neglect Trop Dis 2019, 13(12):e0007978. <https://doi.org/10.1371/journal.pntd.0007978>

Smid J, Althaus CL, Low N, Unemo M, Herrmann B. **Rise and fall of the new variant of Chlamydia trachomatis in Sweden: mathematical modelling study.** Sex Transm Infect 2019, epub Oct 5. pii: sextrans-2019-054057

Cina M, Baumann L, Egli-Gany D, Halbeisen FS, Ali H, Scott P, Low N. **Mycoplasma genitalium incidence, persistence, concordance between partners and progression: systematic review and meta-analysis.** Sex Transm Infect 2019. <https://doi.org/10.1136/sextans-2018-053823>

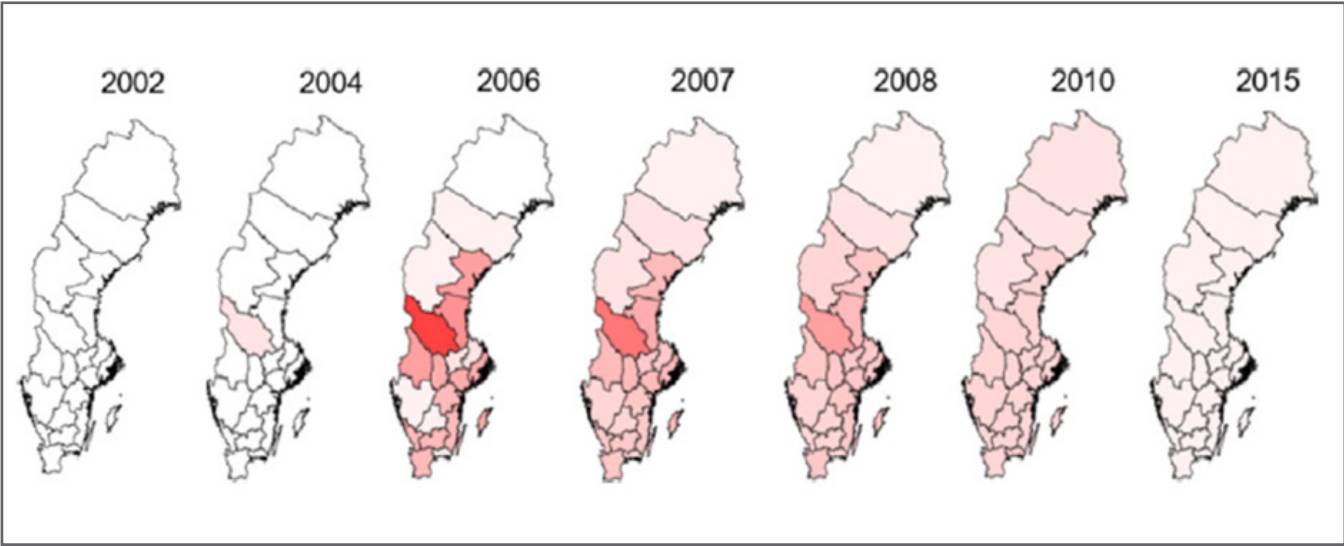


Figure 3:
Rise and fall of new variant of Chlamydia trachomatis (nvCT) between 2002 and 2015 in different Swedish counties. The shading indicates the proportions of nvCT cases among all CT cases.

Social Environment

Innovative contributions to theory and data in social inequality and health research.

Key scientific activities

Theory and measurement development, mostly in the areas of social determinants of health, cultural capital and health, health literacy.

Key academic activities

Research, internal and external teaching, expert activities: research evaluation and assessment, advisory boards and public health consultancy services.
Establishing a new professorship at ISPM.

Grants

NFP 74 Gesundheitsversorgung (04/2017–08/2020): Migrant Women's Health Care Needs for Chronic Illness Services in Switzerland (MIWOCA) (Projektnummer 167428) (CHF 485'879)

Internal and external collaborations

Geneva, Zug (YASS consortium); Genoa, Tübingen, Istanbul (Miwoca); Vancouver, Atlanta, Montreal, Jyväskylä

Key team members

Thomas Abel (Lead), Romaine Farquet, Richard Benkert, Sophie Meyer

Selected publications

Veenstra, G., & Abel, T. (2019). **Capital interplays and social inequalities in health.** Scandinavian Journal of Public Health, 74: 631-634.

Rüegg, R., & Abel, T. (2019). **The relationship between health literacy and health outcomes among male young adults: exploring confounding effects using decomposition analysis.** International Journal of Public Health, 64:535-545.

Rütten, A., Frahsa, A., Abel, T., Bergmann, M., de Leeuw, E., Hunter, D., Jansen, M., King, A., & Potvin, L. (2019). **Co-producing active lifestyles as whole-system-approach: theory, intervention and knowledge-to-action implications.** Health Promotion International, 34(1), 47-59. doi:10.1093/heapro/dax053

Lussi, I., Huber S.G., Keller F., & Abel T. (2019). **Die Capabilities der jungen Erwachsenen und ihre Wahrnehmung von Verwirklichungschancen.** In S.G. Huber (Hrsg.), Young Adult Survey Switzerland, Bd. 2 (S. 122-127). Bern: BBL/OFCL/UFCL.

Rüegg, R., & Abel T. (2019). **Familienkapital und psychische Gesundheit von jungen Erwachsenen in der Schweiz.** In S.G. Huber (Hrsg.), Young Adult Survey Switzerland, Bd. 2 (S. 151-161). Bern: BBL/OFCL/UFCL.

SwissRDL – Medical Registries and Data Linkage

SwissRDL is a team of excellence for medical registries and data linkage, and part of the Institute of Social and Preventive Medicine.

In collaboration with external partners that include medical associations and foundations, SwissRDL develops, implements, hosts, and maintains national and international medical registries and multicenter outcome studies. We ensure high quality data in a secure data center applying strict validation rules, regular data monitoring, and monitoring on site. The support team is in contact with more than 180 hospitals in Switzerland offering help for registry issues and data entry via phone, email, and webinars. We have implemented a comprehensive implant library, which allows the identification and categorization of implants such as hip and knee prostheses, and supports barcode scanner based data transfer and web services to hospitals. SwissRDL offers a full range of support for patient recorded outcome measures (PROMs) on tablets and websites. A project manager and team of statisticians create regular, high quality reports for the registries that include quarterly reports and comprehensive annual reports. We collaborate in scientific analyses of the registry data offering statistical analyses.

We support our partners in medical informatics, patient safety, and privacy protection. Our research focuses on health system and service research as well as health technology assessment. We focus on indication, process, and outcome quality assurance in medicine in collaboration with local, national, and international partners and organizations.

Another core excellence is data linkage. Longstanding experience in building large cohorts such as the Swiss National Cohort (www.swiss-nationalcohort.ch) in which data are linked using probabilistic record linkage methodology has led to our outstanding expertise in linking data for which no unique identifier is available and simple merging is therefore not possible. We also have developed and applied privacy preserving methods for record linkage.

Key scientific activities

In close collaboration with registry partners, SwissRDL creates high quality scientific reports like the annual report of the national hip and knee registry (www.siris-implant.ch). Additionally, we produce benchmark reports for clinics, which allow comparison of



core outcomes between hospitals using funnel plots. SwissRDL participates in several research projects analysing registry data, and supports the linkage of additional data. For medical device suppliers we offer implant reports for specified products. Our data managers and statisticians also analyze data for scientific publications and posters. SwissRDL has been involved in several data linkage projects in Africa, for example linking HIV data with cancer registry data, and supports national and international projects with its expertise in record linkage.

Key academic activities

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

Grants

NFP74 2017-20: Swiss Home Care Data: patient profiles and quality measures for home care (Total CHF 393'182).

SNF 2019-2021: The Swiss Pediatric Hematology/ Oncology Metabank – a network for precision medicine research (CHF 593'638).

Federal Office of Public Health (2020-2024): Swiss Rare Disease Registry (CHF 1.25 Mio., no decision yet)

NFP74 2017-20: Swiss Home Care Data: patient profiles and quality measures for home care; **SNF 2019-2021:** The Swiss Pediatric Hematology/Oncology Metabank—a network for precision medicine research, Swiss Rare Disease Registry, Federal Office of Public Health (no decision yet).

Internal and external collaborations

SwissRDL closely collaborates with medical associations and foundations with which it has mandates to operate the registries. These include the **SIRIS foundation** (www.siris-implant.ch) for the national hip and knee implant registry, with more than 150 hospitals involved, and **Swissnoso** (www.swissnoso.ch) for surgical site infections, with more than 170 hospitals delivering data to SwissRDL. We collaborate with the **Swiss National Association for Quality Development in Hospitals and Clinics ANQ** (<https://www.anq.ch/en/>) and support them as members of expert committees. SwissRDL is in charge of the home care data platform of **Spitex Schweiz** (www.spitex.ch), supporting the data management and the reporting for close to 100 Spitex organizations. Internationally, we are in close contact with registry providers such as the **National Joint Registry** in UK and the **Endoprothesenregister Deutschland**, and participate in meetings and conferences from **ISAR**, the International Society of Arthroplasty Registries. Through implant registries we are in touch with medical device suppliers and offer scientific support for reports and studies.

Key team members

Dr. Adrian Spörri, head of SwissRDL, Dr. Kurt Schmidlin, statistician and record linkage, Dr. Christian Brand, statistician, Dr. Andreas Boss, project manager and record linkage, Martin Drees, programmer, Lilianna Bolliger, monitoring and support

Selected publications

Mai, Dominique; Brand, C; Haschtmann, D; Pirvu, T; Fekete, T F; Mannion, A F (2020). **Non-medical factors significantly influence the length of hospital stay after surgery for degenerative spine disorders.** European spine journal, 29(2), pp. 203-212. Springer 10.1007/s00586-019-06209-5

Hossmann, Stefanie; Haynes, Alan G; Spoerri, Adrian; Diatta, Ibrahima Dina; Aboubacar, Barry; Egger, Matthias; Rintelen, Felix; Trelle, Sven (2019). **Data management of clinical trials during an outbreak of Ebola virus disease.** Vaccine, 37(48), pp. 7183-7189. Elsevier 10.1016/j.vaccine.2017.09.094

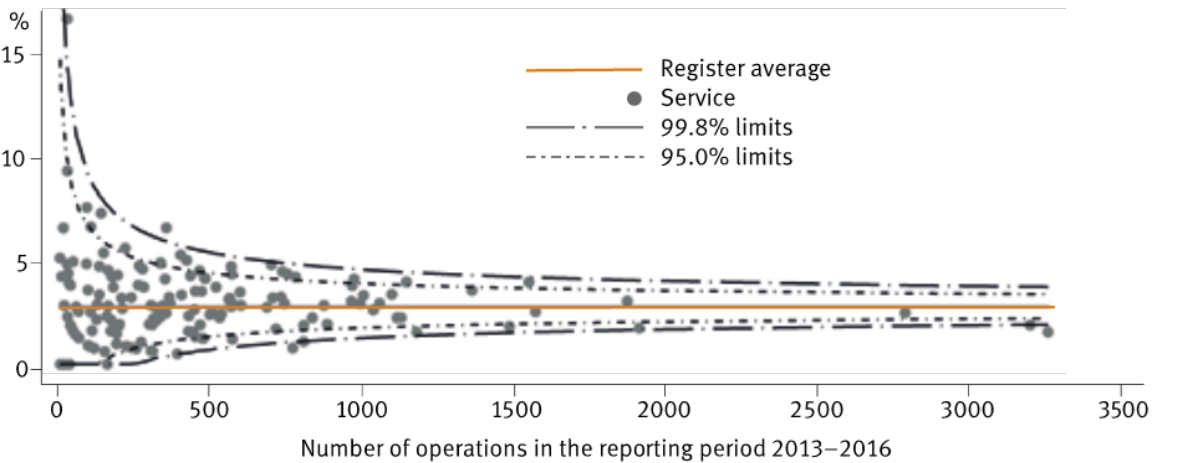
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See annual reports of large registries, e.g. www.siris-implant.ch for SIRIS.

Figure 3.6 2-year revision rate of primary total hip arthroplasty by service



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