UNIVERSITY OF BERN
MCID
MULTIDISCIPLINARY CENTER FOR INFECTIOUS DISEASES

THE SPREAD

A NEWSLETTER FROM THE MCID

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ARTICLES ON:

News from the Center

Dear readers, we hope you enjoy the latest issue of the MCID newsletter, The SPREAD.

The release of this issue brings to a close the first year of the The SPREAD. The issues to date have reflected the multidisciplinary nature of the center, including articles on MCID research covering topics from insecticide resistance in mosquitoes to polarisation during the pandemic and from targeting of antimicrobial resistant bacteria with phages to decision-making in the context of a pandemic. Multidisciplinarity has also been reflected in the subjects of spotlight articles and in interviews with early career researchers from a range of academic disciplines but all focusing on infectious disease research. We would like to take this opportunity to thank all contributors in 2023!

Make sure you keep up-to-date on MCID news and activites by visiting our website and signing up to receive future copies of The SPREAD as well as following us on X (formerly twitter, @MCIDBern) and LinkedIn. Please do share this newsletter with colleagues- we would love it to „SPREAD“ far and wide!

We wish all readers a very happy end of the year and start to 2024 and look forward to bringing you new issues in the year to come.

Yours sincerely,
Rebecca Limenitakis (MCID Managing Director)
Anita Hochuli (MCID Teaching and Outreach Coordinator)

Polarization in the pandemic response?

Article by: Dr. Maximilian Filsinger (Institute of Political Sciences) and Cristopher I. Kobler Betancourt (ISPM) on behalf of the "Divided pandemic society and Public Health" project team

The COVID-19 pandemic has brought to light stark divisions within Swiss society. As the virus raged on, people's risk perceptions, policy preferences, and protective behaviours appeared to diverge drastically. These deep divides presented a challenge for policymakers, health professionals, and the public striving to curb the virus' spread. Our interdisciplinary project, drawing from political science, social anthropology, and public health, delves into the heart of this issue. It aims to explore affective polarization and societal division, particularly in marginalized communities, and explores its links to politics, health behaviour, and outcomes. By synthesizing this knowledge, the project seeks to offer vital recommendations to prepare for future pandemics. This research confronts the intricate interplay between societal divisions, public health, and the need for interdisciplinary cooperation.

Prof. Dr. Markus Freitag
Project Co-Lead, Institute of Political Science

"Affective polarization refers to in-group favoritism and out-group animosity and can be triggered by divisive political events such as governmental responses during a crisis."

Specifically, our project aims to

1. develop and validate instruments to measure affective polarization in support for COVID-19 preventive measures in the Swiss context;

2. research affective polarization in marginalized communities, particularly from immigrant and ethnic minority communities;

3. determine the extent to which affective polarization is associated with political positions, health-related behaviours and health outcomes;

4. synthesize and integrate the knowledge gained to develop policy and practice recommendations

An interdisciplinary and multi-methods research endeavour

We are a multidisciplinary team of researchers with expertise in community health, political science, anthropology, clinical epidemiology, and infectious diseases. Our project moves beyond the usual consideration of (public) health issues as a variable that might shape political preferences or vice versa in political science and beyond the incremental and instrumental use of political science methodology in public health research. We built upon quantitative and qualitative methods to investigate: i. how polarization is linked to political attitudes and behaviour? ii. the relationship between polarization and protective health behaviour and, iii. how polarization is related to COVID-19 care and health outcome patterns.

Prof. Dr. Annika Frahsa
Project Lead, ISPM

"Within the project, we come from different epistemological backgrounds, connected by a shared desire to conduct research with people affected to understand perceived deficiencies in the response to COVID-19 in Switzerland and to improve preparedness and the response to future pandemics."

Affective polarization in the pandemic context

Polarization is a fundamental concept in political science. Traditionally polarization is seen as an increasing divergence in the policy preferences of voters, politicians, or parties. This ideological polarization can be observed across many different political issues, for example in the context of our study regarding the support of protective masks during the COVID-19 pandemic[1]. Polarization can also be understood differently. The concept of affective polarization describes the phenomenon of dislike between citizens who hold different political views or belong to different political parties. Thus, this form of polarization describes the feelings that people have towards people with similar and different political opinions and how these different groups interact with each other. Political scientists speak of high levels of affective polarization if a person has positive feelings towards people with similar political opinions ("the in-group") and negative feelings towards people with a different political opinion ("the out-group"). This form of polarization was first introduced in the US regarding partisan affective polarisation but has been increasingly applied in other established democracies.

Dr. Maximilian Filsinger
Postdoctoral researcher, Institute of Political Science

"Understanding the consequences of affective polarization is crucial as it influences citizens' health behaviour, social interactions, and ultimately the health of democratic societies"

In our project, we apply this concept of affective polarization in the context of the COVID-19 pandemic and investigate whether people who support masks and vaccinations dislike opponents and the other way around. The COVID-19 pandemic provides an excellent case to study affective polarization as it can be triggered by divisive political events such as governmental responses during a crisis. To empirically grasp this concept, Figure 1 exemplifies affective polarization regarding protective masks using two hypothetical individuals, Anna and Peter. First, we ask citizens about their opinion on masks, i.e., whether they support or oppose masks. The upper part of the figure shows that Peter is against while Anna is in favour of protective masks, implying ideological polarization.

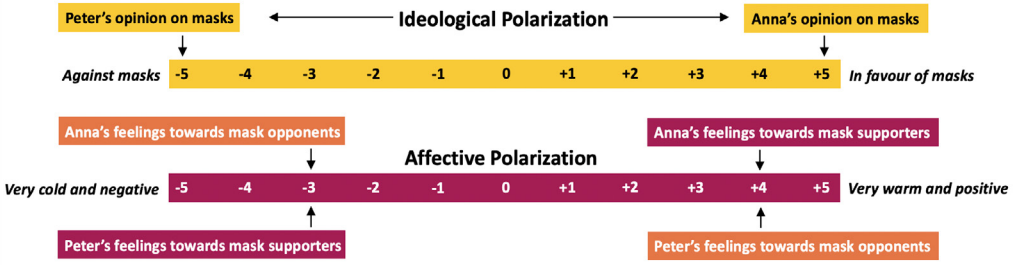
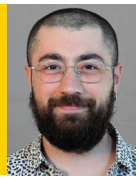


Figure 1: Hypothetical example of ideological and affective polarization regarding face masks

Second, we use a survey instrument called the feeling thermometer, which asks respondents to describe their feelings towards the different groups (e.g., masks supporters and mask opponents) on a scale ranging from –5 (very cold and negative) to +5 (very warm and positive). In the middle part of the figure, we see that Anna, who is supportive of masks feels positive towards other supporters of masks (+4) but negatively about opponents of masks (-3). For Peter, who is a mask opponent, the reversed picture emerges. He feels positive about other mask opponents (+4), but he feels negative about mask supporters (-3). The differences in the feelings that Anna and Peter have for the respective groups is what we call affective polarization.

Our current focus in the project is a systematic review that investigates and synthesises evidence about associations between both forms of political polarization and COVID-19 health behaviours and outcomes. Such a review helps us to accumulate scientific knowledge and it will help to better understand polarization in the context of the COVID-19 pandemic and thus might inform decision making for future pandemics. We aim to explore affective polarization regarding face masks and vaccinations among the general population in the Canton of Bern using

questions included in an online survey conducted as part of preparations for the BEready (short for "Bern, get ready") Cohort study. Furthermore, we aim to dive deeper into the causes and consequences of this form of affective polarization, for example through survey experiments and focus group discussions.



Ipekçi Aziz Mert, MD
PhD student, ISPM

"Our first step is to perform a systematic review that investigates and synthesises evidence about associations between both forms of political polarization and COVID-19 health behaviours and outcomes."

Making pandemic experiences visible and shared

So far, we have conducted seven focus group discussions with 53 participants with a wide age range and who are part of different communities, among those people from rural and urban areas, with different religious denominations, with and without immigration experience, from European countries and the Global South, documented and undocumented, or people who identify as LGBTQ+. We chose an approach that built upon peer research, new materialism, and shared anthropology: we collaborated with peer-researchers who had a biographical connection to the communities we were interested in. Inspired by the work of French cultural anthropologist Jean Rouch, we conducted the group discussions in dinner settings in trusted spaces, such as neighbourhood centres. Here, our carefully crafted clay objects[2], inspired by the „STOP-COVID" posters, served as both conversation catalysts and tangible symbols, bridging the gap between abstract ideas and lived experiences.

Cristopher I. Kobler Betancourt
PhD Student, ISPM

"What started as "fancy" research design transformed into a safe space where our participants found a vessel of relief: finally, to be able to speak up their minds freely and listening to other's experiences unjudgementally."

Figure 2: Making pandemic experiences visible and shared

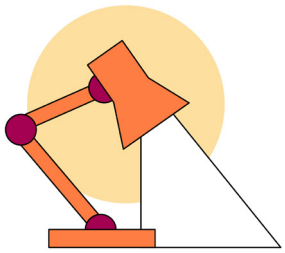
We are currently immersed in the analysis of the data. Yet, this is just the beginning of our journey. We are preparing to take a deeper dive into one-on-one interviews, where the intricate details of personal narratives will come into sharper focus. Beyond that, we are gearing up for a multi-sited ethnography that promises to unveil a profound and nuanced understanding of the interplay between marginality, health beliefs, and societal division in the context and aftermath of a pandemic.

Prof. Dr. med. Nicola Low
Co-Lead, ISPM

"The BEready cohort study is a resource for MCID members and other researchers. For issues like affective polarization, we will be able to monitor changes in the population over time, maybe including what happens when the next pandemic comes"

Project links to BEready, an MCID Core Activity

The project is closely linked to the BEready cohort study. BEready will be a cohort study of households, including their pets, in the Canton of Bern. After a successful pilot study, the BEready team is preparing for the enrolment of around 1500 households. The BEready cohort study will have an in-person baseline visit, as well as annual follow-ups, to collect data both in questionnaires and from biological samples. So, issues like affective polarization and dimensions of marginalization can be investigated and tracked over time. When the next pandemic comes, longitudinal data will aid in understanding its impact and potentially in reducing the negative effects of polarization.



One Health: Why is wildlife health surveillance integral for safeguarding our health?

Article by: Dr. med. vet. Saskia Keller and Med. vet. Isabelle Wethli, Institute for Fish and Wildlife Health (FIWI) Vetsuisse

Awareness of emerging diseases and zoonoses has gained new importance in recent years. Of all emerging diseases (e.g., SARS-Covid-19, Ebola), 75 % have an animal origin, with two-thirds originating from wildlife. Ever-changing abundances of susceptible populations and the dynamics associated with global change, such as urbanisation and globalisation, increase the possibilities for spill-overs at the human-livestock-wildlife interface and thus the risk of the next pandemic. The Swiss nature houses more than 400 vertebrate animal species, which are abundant in many diverse environments and interact with humans and domestic animals on various levels from our gardens to remote alpine regions. Unusual mortality and morbidity events in wildlife can be the first evidence of disease emergence. Effective wildlife health surveillance is therefore crucial for **rapid action in the event of a disease outbreak and its control and containment**, states the World Organization of Animal Health (WOAH).

The Swiss system for managing terrestrial wildlife is characterized by legal, geographical, and administrative fragmentation. In Switzerland, two types of wildlife health surveillance exist under the regulation of the Federal Office of the Environment (FOEN) and the Federal Food Safety and Veterinary Office (FSVO). The targeted surveillance focuses on certain notifiable diseases, such as avian influenza or African swine fever, whereby carcasses meeting specific criteria (species, number of animals affected) that are defined by the animal disease law (Federal Act on Animal Diseases), will be specifically tested for the agent in specialized diagnostic laboratories.

Dr. med. vet. Saskia Keller

Med. vet. Isabelle Wethli

In contrast, the general wildlife health surveillance (GWHS) is based on the hunting law (Federal Act on Hunting and the Protection of Wild Mammals and Birds) overseen by the FOEN and consists of opportunistically found carcasses of various species submitted for a general postmortem examination. The protection of species not covered in the hunting law is subject to the nature protection law (Federal Act on the Protection of Nature and Cultural Heritage), however, with little focus on animal health.

Since 2005, the Institute for Fish and Wildlife Health (FIWI) at the Vetsuisse Faculty in Bern has been mandated by the Federal authorities to act as the national competence center for wildlife diseases of free-living and captive fish and wildlife and conducts the above-mentioned GWHS[1]. Hereby, the GWHS greatly depends on field partners (game wardens, hunters and wildlife biologists) who submit the carcasses.

Multiple challenges and gaps in the current Swiss wildlife surveillance have been identified. First, the GWHS, based on the hunting law, focuses on commonly hunted (e.g. deer, fox) or protected species (e.g. wolf, ibex), with little awareness for the health of other species, particularly smaller garden wildlife like songbirds, hedgehog, and

squirrels. Second, although cantonal authorities often collect information on sick or deceased only a fragment of this data is reported to the national hunting statistic database, which include species and broad categories of causes such as “aged, disease, weakness” or “traffic accident”. Additionally, diseases that are easily diagnosed in the field are rarely submitted to the GWHS and drop under the radar of national disease recording. Third, data are often not unharmonized and not shared among institutions involved in wildlife health in a timely manner, including information on disease occurrence form diagnostic centers or on species population from taxon-specific centers. Consequently, no national database for wildlife health data is universally accessible or available[2].

The current wildlife surveillance approach not only revealed major gaps but also leads to new opportunities for the future. Based on those identified gaps, the project WildGuARDS was initiated and funded by the MCID-Early-Career Research Grant for Women. With a focus on birds, the project was launched to fill the gaps in disease surveillance with the primary goal of establishing an online reporting system (ORS) for diseased and dead birds in Switzerland. Such a system would offer epidemiological evaluations of disease trends and developments in temporal and spatial topicality and the possibility for real-time data analysis. Wildlife surveillance on a local basis can be conducted by citizen scientists, which proved to be a resource-effective way to collect large data[3]. Birds are an interesting taxonomic group to initiate such a project since the citizen engagement is great and there is an abundance of taxons-specific institutions with a deep knowledge in the area (BirdLife etc., Swiss ornithological Institution). Currently, we are defining syndromes - easily recognizable and reportable medical problems - on birds to associate them with diseases. In the long run, these syndromes can be documented on an online platform by simple descriptions and/ or photographs from non-experts in the field.

Figure 1: Data situation in Switzerland and potential solutions (adapted [2])

The future of wildlife disease surveillance and in-depth monitoring will also rely on a close collaboration of different stakeholders and citizens in Switzerland. Given the above circumstances, wildlife health surveillance in Switzerland operates within a multi-stakeholder environment with numerous authorities and institutions within a dispersed legislative framework. WildGuARDS aims to bring all stakeholders involved in bird health monitoring together for the establishment of an ORS and the identification of common needs and challenges of wildlife health and population monitoring. By this, we improve the networking among the various stakeholders, paving the way for further standardisation and centralisation of wildlife health data.

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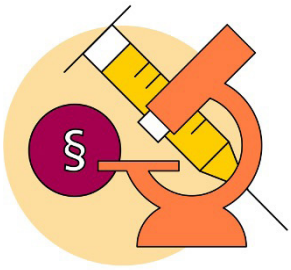

How will we track the spread of respiratory infections in the future?

Article by: PD Dr. Christian L. Althaus, Dr. Judith Bouman, and Martin Wohlfender (Institute of Social and Preventive Medicine, University of Bern), Selina Wegmüller (CTU Bern, University of Bern)

Additional project members: Prof. Dr. med. Guido Beldi (Department for Visceral Surgery and Medicine, Bern University Hospital), Dr. med. Julien Riou (unisanté, Lausanne), Prof. Dr. Alex Leichtle (Institute of Clinical Chemistry, Bern University Hospital), PD Dr. Alban Ramette, Dr. Loïc Borcard (Institute for Infectious Diseases, University of Bern)

The COVID-19 pandemic has shown that decision-makers and politicians need to be rapidly informed about changes in epidemic trends to guide the public health response. Current systems to monitor infectious diseases are typically based on surveillance data that are systematically collected during an epidemic, e.g., the number of laboratory-confirmed cases. However, other data sources, such as seroprevalence surveys, genomic sequencing, wastewater data, and electronic health records (EHRs) from hospital patients, could be used to improve the reliability of surveillance systems. In our MCID project, a multidisciplinary team of researchers from the Institute of Social and Preventive Medicine, the Department for Visceral Surgery and Medicine, the Institute for Infectious Diseases, and the University Institute of Clinical Chemistry develops and tests novel tools that can be used to track the spread of COVID-19 and potentially other respiratory infections in Switzerland (figure 1).

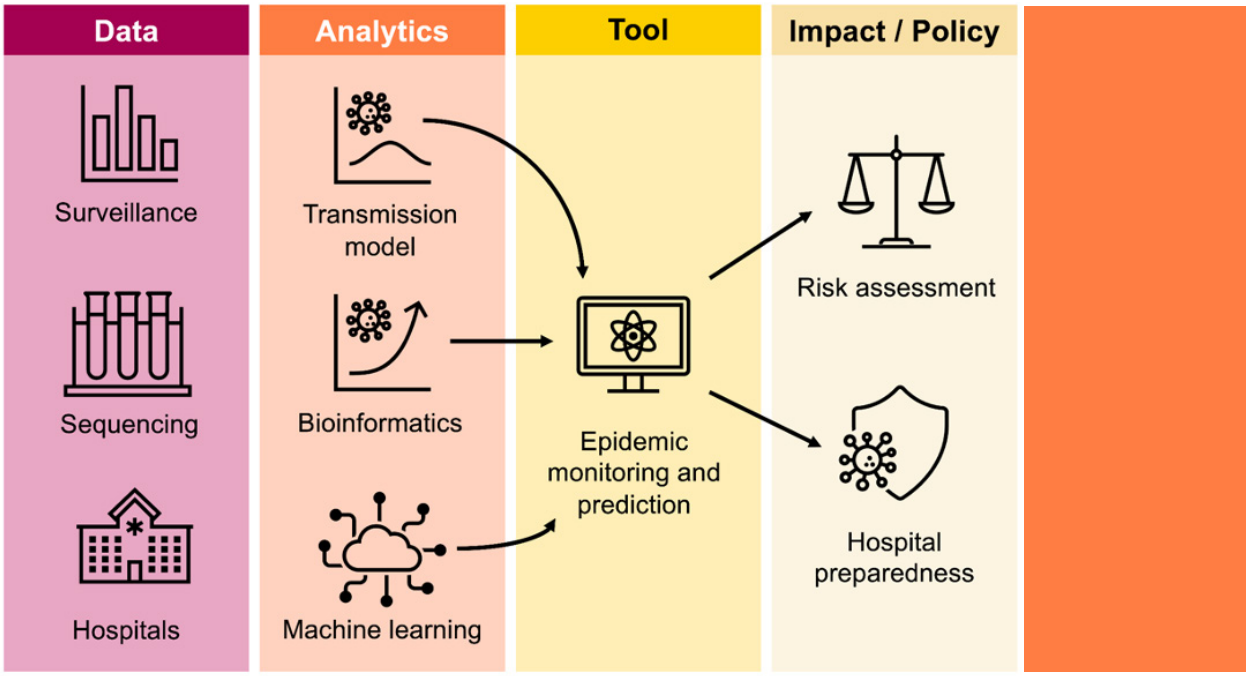

Figure 1: Development and impact of a tool to track the spread of COVID-19 and potentially other respiratory infections in Switzerland.

Mathematical modeling of infectious diseases is a powerful tool for linking different data sets and drawing conclusions about the underlying transmission dynamics of pathogens. During the COVID-19 pandemic, public health authorities primarily relied on the daily number of laboratory-confirmed cases to assess the epidemic situation.

However, these data present certain limitations as only a fraction of all infected cases are tested and reported. In order to obtain a full picture of the epidemic and disease burden, additional data sources are essential. Seroprevalence surveys, which estimate the prevalence of antibodies against a disease, offer valuable insights. We developed a dynamic transmission model of COVID-19 in Switzerland that leverages both the daily number of laboratory-confirmed cases and seroprevalence data to uncover the true epidemic curve[1].

PD Dr. Christian Althaus

Specifically, our model can account for (a) the incomplete ascertainment of laboratory-confirmed cases, (b) the observed variance in reported cases, (c) a transmission rate that changes over time, and (d) disease transmission across subpopulations. When we applied this model to laboratory-confirmed SARS-CoV-2 cases and two seroprevalence studies from the canton of Geneva in 2020, we were able to obtain detailed estimates of how the transmission rate and the ascertainment of cases changed over the year (figure 2). These results will help to better assess the impact of non-pharmaceutical interventions, behavioral changes and seasonal effects during the COVID-19 in Switzerland.

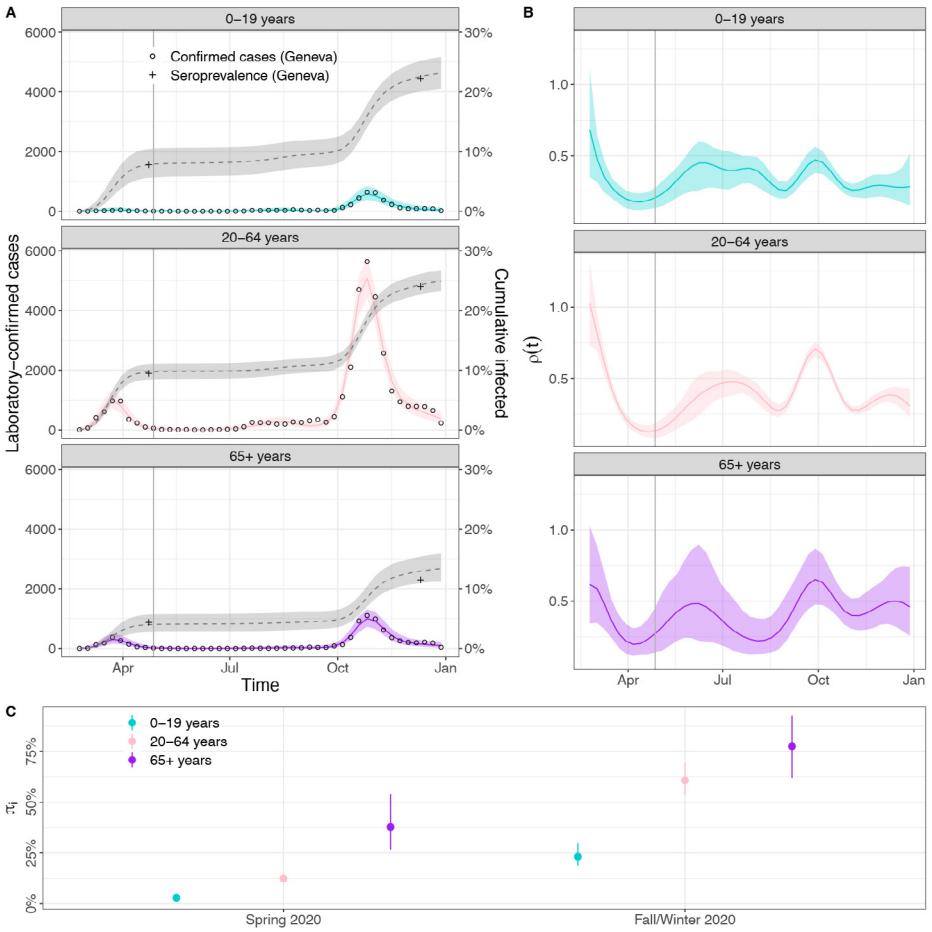

Figure 2: Modelled SARS-CoV-2 epidemic in Geneva, Switzerland, in 2020. (A) Posterior predictive plot for laboratory-confirmed cases and cumulative incidence per age group. Circles are weekly counts of laboratory-confirmed cases and pluses are estimates of seroprevalence at two time points. (B) Estimates of the time-varying change in transmission rate per age group. (C) Estimates of the ascertainment rate per age group and time period.

Data science has emerged as a transformative force in epidemiology and public health and has the potential to revolutionize future surveillance systems. By harnessing the multidimensional data of EHRs, we use methods from machine learning and artificial intelligence to detect previously unidentified patterns, associations, and interactions that can predict the number of hospitalizations due to COVID-19 in the canton of Bern in the coming weeks to support hospital preparedness. In close collaboration with the Insel Data Science Center (IDSC), we developed a pipeline to collect and harmonize a large number of EHRs from the Bern University Hospital.

Dr. Judith Bouman

We are currently developing indicators based on time series data of clinical information, such as the weekly number of specific diagnoses in certain age groups of patients, using state-of-the-art methods from machine learning. We will then test whether these models can improve the predictive capacity of standard models that are based on the past numbers of hospitalized patients alone. This part of our MCID project fits seamlessly with other initiatives of Bern University Hospital and the Swiss Personalized Health Network (SPHN) to harmonize and integrate data flows, develop secure data pipelines and apply machine learning methods that meet the needs of future research in clinical medicine, epidemiology and public health.

In order to improve future pandemic preparedness in Switzerland, it will be important to integrate the newly developed tools into the existing surveillance systems and decision-making processes. To this end, we organize stakeholder events and engage in the current dialogue about the science-policy interface in Switzerland, with support from the MCID Ethics and Policy Lab. We recently organized the Swiss Meeting for Infectious Disease Dynamics (SMIDDY), which focused on infectious disease modeling and its role in policy making. Representatives of several research institutes from Switzerland and abroad and the Federal Office of Public Health (FOPH) discussed the current challenges and opportunities to improve the surveillance systems for infectious diseases.

Martin Wohlfender

Selina Wegmüller

The output from our project is also of relevance for the upcoming revision of the Epidemics Act in Switzerland. In a thesis paper that was mandated by FOPH, we recommended the definition of clear and operationalizable epidemiological criteria for epidemic risk assessment, which requires improved methods to analyze and interpret surveillance data[2]. In summary, our MCID project has the potential to significantly improve our capabilities to track the spread of infectious diseases in Switzerland and will assist decision-makers to make informed decisions for managing the transmission of COVID-19 and other infectious disease threats in the future.

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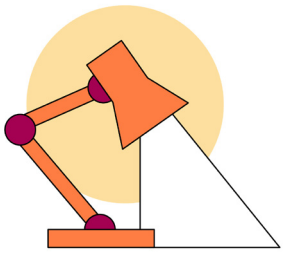

Medical Extended Reality in acute medicine: application in education and training and clinical practice

Article by: Prof. Dr. med. Thomas C. Sauter and Prof. Dr. med. Wolf E. Hautz, Department of Emergency Medicine, Inselspital Bern

„A patient is brought to the University Department of Emergency Medicine at Inselspital by helicopter at 3 am. He has had a motorcycle accident with severe injuries to the pelvis and both legs, has lost a lot of blood and is circulatory unstable. With initial assessments and immediate measures as well as the transfusion of blood products, no stabilization of the circulatory situation can be achieved. Therefore, the emergency team decides to stabilize the patient with a REBOA catheter, which can be used to temporarily occlude the aorta and thus stop the bleeding, in order to gain the necessary time for transport to the operating room.

Placing this catheter is a highly acute but rarely used procedure for which the emergency medicine physician is well trained. She prepared intensively for this moment with e-learning to learn the necessary theoretical principles and indications for the application, with classic simulation training on simulation mannequins, but also with virtual reality procedure training that allowed her to practice the procedure independently as many times as she wanted without relying on simulation mannequins, preparation time, and other simulation devices.

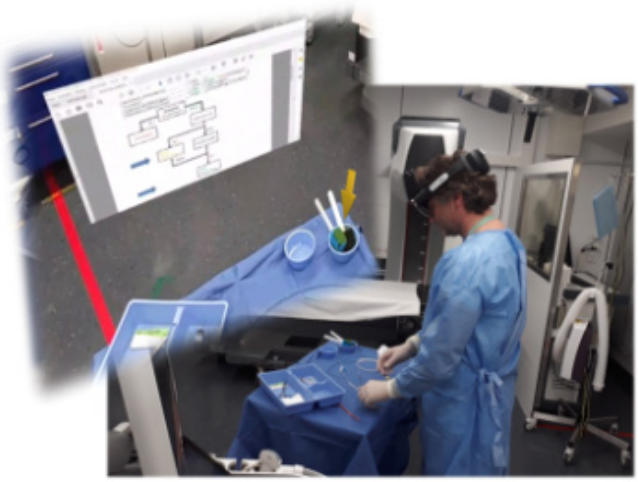

Figure 1: HALO-Assist application in the shock room of the University Department of Emergency Medicine.

Nevertheless, in the middle of the night in this critical situation under stress, she wants to call in all possible help and has respect for the potentially life-saving but dangerous and complex procedure. That‘s why she puts on the augmented reality headset and uses them to call for help directly to the trauma bay. The augmented reality headset show her flowcharts and checklists designed to address her problems during the procedure. Arrows and other visual hints can be superimposed on her field of vision and reality. With images and sound, she is guided through the procedure step by step from a distance.

Fortunately, insertion of the REBOA catheter goes without a problem. The patient can be temporarily stabilized and taken to the operating room for definitive care.“

One of the challenges in emergency medicine is to ensure high-quality care around the clock in times of increasingly scarce financial resources and a growing shortage of specialists. In particular, a high level of expertise is essential for performing rare but critical interventions, the so-called HALO „High-Acuity and Low-Occurence" procedures. Procedures with potentially high risk but also potentially high benefit to the patient must be performed safely under pressure and stress. Previous training approaches for training HALO procedures such as classical simulation training are limited in availability and resource intensive.

Prof. Dr. med. Thomas C. Sauter

Medical Extended Reality, which has found its way into many branches of industry in recent years, but also into medicine, can offer promising solutions here. Medical extended reality includes augmented reality and virtual reality[1].

Augmented reality overlays the real world with digital information and can convey information by adding contextual and interactive digital elements that can also be interacted with. The reference to the real world is retained in the process.

Virtual Reality is a technology in which the user is fully immersed in and interacts with a 3D environment using a device worn on the head. Fundamental to learning with virtual reality is immersion, the feeling of being in the virtual environment. Virtual reality simulations have proven to be a useful and effective tool especially for training technical skills and procedures i.e. procedural training. The advantages of virtual reality for the training of emergency situations are mainly the scalability, which is especially important for the arbitrary repetition of high-risk or resource-intensive training topics, and the autonomous training, which can be conducted independent of location and time.

Prof. Dr. med. Wolf E. Hautz

The HALO-MXR concept of the University Hospital for Emergency Medicine at the Inselspital Bern described in the example above includes e-learning, location- and time-independent simulation-based training in virtual reality and HALO-Assist support via augmented reality headset live in the trauma room. HALO-Assist provides around-the-clock support for HALO procedures with communication via audio and video with superimposed commentary and flowcharts. The HALO-MXR concept at Inselspital demonstrates how MXR simulation-based training in VR and AR can be effectively combined and used in everyday life. By using MXR in acute medicine, a more efficient use of resources can be achieved and extended training possibilities can be created.

Reference

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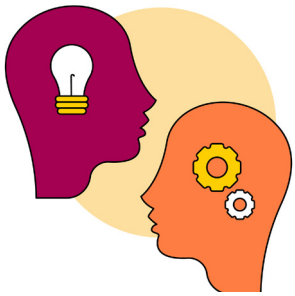

Bright and early: meet two MCID early career researchers

Interview with:
Prof. Dr. Tim Rollenske, Recipient of MCID Early Career Research Grant, Department for BioMedical Research (DBMR), and Institute of Molecular Medicine and Experimental Immunology (IMMEI), University of Bonn, Germany, and
Dr. Evangelos Karousis, Recipient of Career Development Grant, Department of Chemistry, Biochemistry and Pharmaceutical Sciences (DCBP)

Can you describe briefly your MCID-funded project and what you aim to achieve?

Prof. Dr. Tim Rollenske

Tim: The project "Klebsi-mAb" aims to generate a protective monoclonal antibody (mAb) to *Klebsiella pneumoniae*, a frequently multi-drug resistant nosocomial pathogen that infects newborns, immunocompromised and the elderly. We use defined *K. pneumoniae* intestinal colonization of germ-free mice to select and obtain mAbs from intestinal B cells that possess protective capacity for a broad range of bacterial Kp isolates. The long-term goal is, to use these mAbs for pre-emptive therapy or treatment option in human *K. pneumoniae* infection.

Evangelos: Our MCID-funded project focuses on the interplay between viral proteins and host cell translation. Using the SARS-CoV-2 non-structural protein 1 (Nsp1) we aim to comprehensively understand how Nsp1 selectively inhibits host protein production while ensuring viral protein translation. Our research is structured around three main objectives: dissecting the mechanisms of Nsp1-mediated translation inhibition, studying Nsp1 proteins across various coronaviruses to identify similarities and differences, and developing a screening platform for potential therapeutic inhibitors. Employing innovative cell-free translation systems and other methodologies, our work is poised to not only shed light on COVID-19 but also enhance our overall grasp of viral infections, guiding future research and supporting pandemic preparedness.

How do you think your project can contribute to preparation for infectious disease threats?

Evangelos: The COVID-19 pandemic was a clear example of how basic research can prove crucial in times of need. Our discovery, early after the breakout of the pandemic that Nsp1 from SARS-CoV-2 uses the host cell translation to its benefit[1] was possible because of the expertise of different groups, and long-term intellectual and financial investments in basic research allowed us to provide timely answers to a crucial viral process. My lab focuses on deciphering the secrets of human mRNA translation in health and disease, and our findings, especially in the context of viral infections, can be used to provide timely therapeutic and preventive measures either by applying developed tools or by elucidating modes of action that apply in different parasites.

Tim: Increasing appearance of antibiotic resistance in bacteria is referred to as "the silent pandemic". Pan-resistant isolates of *K. pneumoniae* have been readily identified. Klebsi-mAb might give us a treatment option for this scenario.

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What excites you about multidisciplinary research?

Tim: Getting a view from outside my field onto our research always broadens my perspective on my own research topic. For me, performing multidisciplinary research is very thought-provoking and generates a lot of creativity.

Dr. Evangelos Karousis

Evangelos: Multidisciplinary research merges diverse methods, fosters global approaches to problem-solving and provides insights into different disciplines. It incites collaborations, tackling issues from multiple perspectives and ensuring a more holistic and comprehensive understanding. By breaking conventional boundaries and leading to more effective and inclusive solutions, multidisciplinary research is more impactful and represents the synergy of knowledge, transcending individual disciplines.

What do you see as being the main challenges in multidisciplinary research?

Evangelos: The primary challenges in multidisciplinary research include, in my view, grasping intricate concepts across diverse fields, investing time in familiarizing with new disciplines, and assuring transparent and continuous communication. Initiatives like the MCID are crucial in mitigating these hurdles, fostering an environment that encourages interdisciplinary synergy and knowledge sharing.

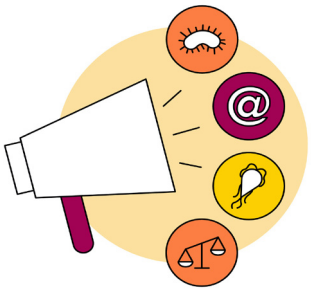
Tim: In my opinion it needs a lot of dedication, time, and energy to work in a multidisciplinary team. Although, the effort is worth it, we sometimes do not speak the same language.

How has MCID early career researcher funding helped you advance in your academic career?

Tim: Definitively. It helped me to show that I can acquire my own independent funding. I think it laid the foundation for my subsequent grant approvals and my current position. More importantly, it allowed me test one of my research ideas. Future publications based on MCID-funding will help me to augment my research area and accelerate my own science.
Read Tim's bio:

Evangelos: Receiving early career funding from the MCID has been instrumental in propelling my academic journey. It allowed me to establish my independent line of research and facilitated the acquisition of further funding that supports my junior group leader role at the Department of Chemistry, Biochemistry and Pharmaceutical Sciences. My participation in the MCID fosters productive interdisciplinary interactions but has also provided me with the opportunity to apply my teaching and mentoring skills in the development of the MCID courses.
Read Evangelos' bio:

Reference
[1] Schubert, K, Karousis, ED, Jomaa, A et al. SARS-CoV-2 Nsp1 binds the ribosomal mRNA channel to inhibit translation. Nature Struct Mol Biol (2020)



News

MCID Early-Career Researcher, Evangelos Karousis, receives SNSF Spark funding
MCID Microbiology Cluster member, Evangelos Karousis, has received SNSF Spark funding, as well as a Claude et Giuliana foundation grant to support his ongoing research, including activities linked to his MCID-funded project

MCID Microbiology Cluster Members, Ronald Dijkman and Jenna Kelly, awarded SNSF COST funding
Ronald Dijkman and Jenna Kelly have been successful in applying for SNSF COST funding as part of the COST Action „European Swine Influenza Network- ESFLU", allowing an expansion of research linked to their MCID-funded research project

MCID Co-Chair, Carmen Faso, interviewed in the Unibern International newsletter and blog
MCID Co-Chair, Carmen Faso, is interviewed together with Thomas Breu, Director of the CDE, and Hugues Abriel, Vice-Rector Research, on the MCID and CDE's roles in Co-Leading ARUA-The Guild Clusters of Research Excellence

Events

MCID symposium on the revision of the Swiss Epidemics Act
On 16th January 2024, the MCID will host an information event on the revision of the Swiss Epidemics Act. The event (in German) will present the revision process and allow exchange between scientists, politicians and the administration

One Health Symposium, Network Biological Risk: 1st December
On 1st December, the newly founded „Netzwerk Biologische Risiken" will hold a first symposium on the topic of One Health, with a presentation of the Network and talks on a range of One Health topics

Open house event (Tag der offenen Tür) at sitem-Insel: 2nd December
On 2nd December, the sitem-Insel and Community will hold an open house public event on the topic of translational medicine, including an MCID-sponsored Round Table on Antibiotics activity

Save the date- Global Health Themenabend
On 30th January, Global Health Inselspital will hold an MCID-sponsored event, with a focus on the theme of fairer distribution of health and its provision globally. Futher details to follow

Bern Parasitology Meeting
On 2nd February, the first Bern Parasitology Meeting will be held. This MCID-sponsored, multi-disciplinary event aims to bring together all parasitology researchers at the University of Bern to strengthen ties and build new collaborations

MCID seminar series
Visit the MCID website to stay up-to-date with the MCID seminar programme. MCID seminars are held in-person and are aimed at a multi-disciplinary audience

Highlighted publications

Evangelos Karousis on Nsp1-mediated shut-down of host cell protein production by coronaviruses
MCID Career Development Grant recipient, Evangelos Karousis, and collaborators investigate mechanisms by which SARS-CoV-2 and other coronaviruses shut down host cell translation, research funded by Dr. Karousis' MCID-funded project

Fritz Sager and Céline Mavrot on blame-avoidance and crisis management during the Covid-19 pandemic
MCID Society and Law Cluster Co-Chair, Fritz Sager, with Céline Mavrot, investigates governmental crisis management in Switzerland during the Covid-19 pandemic, revealing fragmented crisis governance and policy learning processes

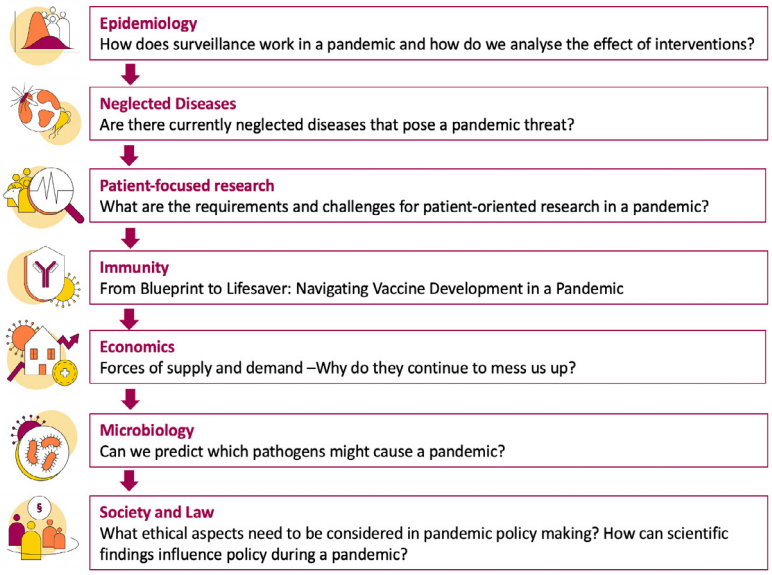
Artur Summerfield et al. on the effect of swine influenza viruses on host cell immune responses
MCID members, Artur Summerfield and Obdulio García-Nicolás, and colleagues investigate swine influenza virus shut down of host cell innate immune responses, important in the design of swine live attenuated influenza viruses for vaccination

Britta Lundström-Stadelmann on the development of drug screen assays for cystic echinococcosis
MCID member, Britta Lundström-Stadelmann and colleagues develop *in vitro* assays for the identification of compounds active against the parasite *Echinococcus granulosus sensu stricto*, for which limited treatment options are yet available

What is Pandemic Preparedness?

Autumn 2023 saw the launch of the MCID's first Colloquium on Pandemic Preparedness, a teaching course aimed at Bachelor and Master students, and in particular exchange students. The development of the course was supported by the University of Bern Vice Rectorate Development „Additional Courses in English- EngIL" scheme.

The aim of the course was to provide a multidisciplinary introduction to the topic of pandemic preparedness, focusing not only on biomedical aspects of preparing for infectious disease threats but also societal aspects. The colloquium was designed around the scientific discipline cluster structure of the MCID and over a series of seven sessions, MCID experts from each cluster conducted lectures and led hands-on exercises and discussion sessions.



The colloquium was attended by 15 students from a range of different study programmes, who engaged enthusiastically in the course. In a final examination session, students presented preparedness plans to counter threats from different infectious agents. The colloquium was well-received by students and paves the way for future MCID multidisciplinary teaching activities.

We are very grateful to all those from the MCID who contributed to this colloquium: Economics: Chantal Morel, Epidemiology: Nicola Low and Judith Bouman, Immunity: Artur Summerfield, Martin Bachmann and Mona Mohsen, Microbiology: Ronald Dijkman, Neglected Diseases: Obdulio García-Nicolás and Hansjakob Furrer, Patient-Focused Research: Alexander Leichtle, Society and Law: Caroline Schlaufer and Bettina Zimmermann.

Presentation of MCID to South African Parliamentary Delegation

On 23rd October, Prof. Carmen Faso, MCID Co-Chair, had the honour of meeting the South Africa Parliament's Portfolio Committee on Higher Education, Science and Innovation as part of a Switzerland-wide tour organised by the Embassy of Switzerland in South Africa. Carmen presented the MCID and it's ongoing research activities and focussed especially on the center's involvement in the Cluster of Research Excellence (CoRE), Genomics for Health in Africa. The Committee was enthusiastic for what lies ahead as the CoRE takes shape and this visit helps cement the MCID's strengthening ties to cutting edge omics and structural biology research activities in South Africa.

THE SPREAD
A NEWSLETTER FROM THE MCID

The Multidisciplinary Center for Infectious Diseases (MCID) is a strategic center of the University of Bern, Switzerland, founded through the generous support of the Vinetum Foundation

Register here to receive future copies of the newsletter by email and visit the MCID website to read more about MCID activities and news

Image (front and back cover) courtesy of Cristopher I. Kobler Betancourt, designed with the assistance of DALL·E

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