



# ANNUAL REPORT 2024



CONTENTS

Introduction .....4

ResearchInsights .....6

Research Projects..... 10

Building for the Future..... 18

Management & Publications .....26



# Letter from the management

Since its inception in 2013, the Centre for Intervention Science in Maternal and Child Health (CISMAC) has been dedicated to improved health and survival of mothers and children in low- and middle-income countries (LMICs). As expressed in our mission, we focus on research that identifies effective and equitable interventions to address the significant health challenges faced by disadvantaged women and children in these countries.

We believe that international collaboration is crucial for achieving equitable improvement in maternal and child health and development. We strive to foster strong partnerships with researchers and institutions in LMICs, ensuring that research projects are jointly conceived and implemented. This collaborative approach not only upholds ethical principles of global health research but also ensures the relevance and enhances the quality of our work and utilization of findings.

CISMAC actively engages in building strong collaborations, such as in EpiCap (please see page 22), which aims to strengthen our consortium’s expertise in epidemiology and action-oriented research. We also actively participate in the Bergen Centre for Ethics and Priority Setting (BCEPS),

a new Centre of Excellence dedicated to advancing health equity.

After its funding from the Research Council of Norway ends in September 2025, CISMAC will transition towards a new phase, with some continued support from the University of Bergen. We recognize the funding constraints this entails and the challenges in procuring collateral funding posed by the evolving global landscape. The current geopolitical climate, characterized by rising nationalism and a growing focus on domestic priorities, may create obstacles for securing the resources required for necessary global health research and action.

Despite these challenges, we remain committed to our mission that we feel is even more relevant in such context. Developing interventions which improve the health of mothers and children in LMICs is a crucial step towards a more just world, with less poverty

**Moving forward, we will prioritize research that focuses on:**

- Developing and evaluating cost-effective and realistically implementable interventions. This includes exploring the potential of biomedical interventions, such as vaccines, and behavioral interventions that can

be effectively delivered within resource-constrained settings.

- Advocating for global health equity: We will, together with BCEPS, actively engage with policymakers, international organizations, and civil society to advocate for increased investment in maternal and child health research and action in LMICs.

We are aware that the rise of nationalistic rhetoric in some parts of the world could challenge our zeal. However, so far, Norway has thankfully not seen such rhetoric arising among

the mainstream parties in our parliament, and our Overseas Development Cooperation Policy has, overall, received broad parliamentary support. This makes us hopeful that we will be able to expand our engagement with Norwegian and other European public institutions and continue to work collaboratively with our LMIC partners, engaging a broader network of stakeholders, including multilateral organizations such as the World Health Organization and the GAVI Alliance. This way, we will maximize our strengths and can together make significant contributions to equitably improving maternal and child health worldwide.



*Halvor Sommerfelt*  
Halvor Sommerfelt,  
Director



*Ingvild F. Sandøy*  
Ingvild F. Sandøy  
Deputy Director



*Jose Martinez*  
Jose Martinez  
Scientific Coordinator



*Iselin H. Kvamme*  
Iselin Henriksen Kvamme  
Head of Administration



Two boys on bicycle, Nepal.  
Credit: Тетяна Вичержаніна, Colourbox



# RESEARCH INSIGHTS

## Preventing adolescent childbearing with interventions outside the health sector

CISMAC conducts research focused on in the continuum of care of maternal and child health. Teenage pregnancy is common in many low- and middle-income countries. The Research Initiative to Support the Empowerment of girls (RISE) was a cluster randomized controlled trial conducted in Zambia on the prevention of adolescent childbearing. ►



One third of girls in Zambia give birth before their 18th birthday, and this is in part due to poverty, social norms and misconceptions about modern contraceptives. The RISE trial estimated the effects of providing economic support, comprehensive sexuality and life skills education, and community dialogue meetings. Almost 5000 adolescent girls in 157 schools in rural Zambia were enrolled and followed up for 4.5 years. The main paper from the trial was published in eClinicalMedicine in December 2024.

We talked to Professor Ingvild Fossgard Sandøy, who was the Principal Investigator of the trial. She is a Professor at the University of Bergen.

*What was the background for conducting the trial?*

Getting pregnant before 18 can be risky for both the girls and their babies. Babies are more likely to be born early, have low birth weight, and die in the newborn period. The girls face a higher risk of complications. There are also social consequences like dropping out of school and early marriage, which can affect their future economic prospects and wellbeing. Studies show that girls who stay longer in school are less likely to get pregnant early. However, in settings where secondary school fees are substantial, children from poor families have a high risk of dropping out. Giving financial support to girls and their families can encourage girls to stay in school longer and has been found to reduce adolescent childbearing in some settings. The RISE project aimed to find out whether such support could help in a setting where lack of school places at the secondary level contributed to girls not proceeding beyond primary school.



Credit: GCShutter, iStock

Before starting the trial, we interviewed girls, parents, teachers, health workers, and community leaders in different parts of Zambia. They mentioned that in addition to poverty and dropping out of school, social pressure to have children and get married, and lack of knowledge about birth control, are common reasons why girls get pregnant at a young age.

*What did the interventions you evaluated consist of?*

The participants were randomly assigned to one of three groups: an economic support group and a combined support group as well as a control group. The girls in all three groups received basic school supplies. In the economic support group, the girls also received cash (ZMW 30 ≈ 30 NOK in 2017) every month, payment of school fees in grade eight and nine, and their families got a ZMW 350 cash grant each year for two years. In the combined support group, girls and their families were given the same financial help as in the economic support group, and they were invited to regular youth club and community dialogue meetings about health and education. Girls and boys met twice a month in a youth club to talk about sexual and reproductive health, setting goals and being assertive. In the community dialogue meetings, parents and other community members engaged in discussions about issues such as the importance of education and the risks of early pregnancy. Films about early pregnancy and why education is important for girls were also shown. The interventions lasted for approximately two years, during the time from when the participants finished primary school to when they were expected to complete junior secondary school.

*Following up almost 5000 girls across 157 schools for 4.5 years sounds like a daunting task. Did you encounter any challenges?*

Yes, it was a big task. The 157 schools were spread across 12 districts in two provinces, covering an area with a diameter of 700 km. Fortunately, the included schools, the Ministry of Education, and the traditional leaders supported the project, and this contributed to the communities being very positive. We stayed in touch with all the participants by interviewing them every six months. A major challenge was that many of the girls moved away after dropping out of school and we had to send research assistants to follow them up in other places. We also did interviews with some of the participants over the phone. Thanks to our dedicated and hard-working research assistants who developed good relationships with the participants, we managed to interview more than 95% of the

original participants 4.5 years after they were recruited. This is exceptionally high for a study of this duration.

*Did you find any effects of the interventions?*

The economic support reduced reported sexual activity among adolescent girls while the support was given. The sexuality education and community dialogue meetings also contributed to reducing sexual activity and increased the use of birth control among sexually active girls. The combined support lowered the proportion of girls who gave birth while they were receiving support, especially among the older adolescents. It also made early marriage less common. However, when the support ended, the number of girls who became pregnant increased, so two years after the support ended, there were only minimal differences in childbearing between the groups. Interestingly, the combined support greatly increased the proportion of students who took and passed their grade nine exams and who moved on to senior secondary school. This is likely to be very beneficial for their future economic situation and for the health of their future children.

*Do these findings have any implications for policy?*

The findings of this study and similar studies suggest that economic support combined with comprehensive sexuality education and community dialogue may have small effects on reducing adolescent childbearing and moderately



Credit: Olena Latkun, Colourbox

increase completion of basic education. Since both our trial and similar studies have found that the effects on childbearing declined quickly after the support ended, it is plausible that such support should be provided until girls reach age 18 and their risk of complications from pregnancy declines, or that additional interventions are needed to achieve greater reductions in adolescent childbearing.

The funding for the study was obtained from the Research Council of Norway, and Swedish International Development Cooperation Agency (through the Swedish Embassy in Lusaka).

**ZAMBIA**

RISE

**FACTS**

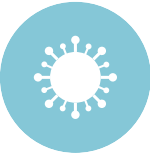
- Study:** [RISE](#)
- Location:** Zambia
- Principal Investigator:** Ingvild Fossgard Sandøy
- Co-principal Investigators:** Patrick Musonda
- Co-investigators:** Mweetwa Mudenda, Joseph Mumba Zulu, Ecloss Munsaka, Hanne Keyser Hegdahl, Choolwe Jacobs, Joar Svanemyr, Taran Grønseth, Bertil Tungodden, Astrid Blystad, Linda Kampata Olowski, Karen Marie Moland, Mpundu Chikoya Makasa, Ottar Mæstad, Amani Thomas Mori, Knut Fylkesnes.
- Partners:** University of Zambia, University of Bergen, Chr. Michelsen’s Institute, Norwegian School of Economics.

# RESEARCH PROJECTS



## COMAC

From March 2020 to early 2023, Uganda faced several waves of the COVID-19 pandemic. A high urban population density and extensive and necessary social interaction along with challenging hygienic conditions represented major impediments to the country’s battle against COVID-19. COMAC contributes to describe the spread and impact of the COVID-19 pandemic in vulnerable populations in Uganda. The project has a particular focus on HIV-1 positive women and their babies.



Principal Investigators: Victoria Nankabirwa and Halvor Sommerfelt

## RISE

In Zambia, approximately one third of young girls in rural areas have given birth by the age of 18. Adolescent pregnancies pose significant risks to both mothers and their babies. The Research Initiative to Support the Empowerment of girls (RISE) estimated the effect of economic support, comprehensive sexuality and life skills education and community dialogue on early childbearing in rural Zambia. Nearly 5,000 grade seven girls from 157 rural schools were enrolled in the 5-year school-randomized trial. The combined support appeared to give a minimal reduction in births before the 18th birthday but a substantial increase in the proportion sitting for grade nine exams. The economic support alone had smaller effects.



Principal Investigator: Ingvild Fossgard Sandøy | Co-Principal Investigator: Patrick Musonda

## Cost-Benefit RISE

Adolescent pregnancy is one of the greatest development challenges facing low- and middle-income countries, not only because it represents a danger to mother and child, but also because of its profound social and economic consequences. This economic evaluation investigated the short- and long-term costs per unit health and non-health gain of providing economic support to adolescent girls and their guardians / parents, as well as comprehensive sexuality education and community dialogue to delay pregnancy and childbearing to an appropriate age in CISMACH’s RISE trial.

Principal Investigators: Ingvild Sandøy, Patrick Musonda | Study Lead: Amani Thomas Mori

## B<sub>12</sub> in Pregnancy

Worldwide, vitamin B<sub>12</sub> deficiency is common, affecting people of all ages. It can lead to a wide variety of health problems. In this study, we estimated the effect of giving daily oral vitamin B<sub>12</sub> supplements to pregnant women until they had given birth and for a 6-month period thereafter on the neurodevelopment and growth of their children. We found that such supplementation did not affect their infants’ growth or development, which is in support of current recommendations of not providing such supplements even in populations in whom vitamin B<sub>12</sub> deficiency is common.



Principal Investigators: Tor A Strand, Ram Krishna Chandyo, Laxman Prasad Shrestha

## Child B<sub>12</sub> Follow-up

Vitamin B<sub>12</sub> deficiency is common and can occur at all ages. This study follows up children who participated in a placebo-controlled randomized trial in Nepal, assessing effects on child growth and neurodevelopment, one and two years beyond supplementation with vitamin B<sub>12</sub> to infants. Children who were supplemented with vitamin B<sub>12</sub> in infancy had a substantially improved vitamin B<sub>12</sub> status. However, there were no effects of vitamin B<sub>12</sub> on any of the neurodevelopmental outcomes measured up to 4 years after the end of supplementation. The results from our study do not support widespread vitamin B<sub>12</sub> supplementation in young children.



Principal Investigator: Tor Strand | Co-Principal Investigators: Laxman Shrestha, Prakash S Shrestha

## cKMC

Nearly 80% of infant deaths occur in babies born with low birth weight (LBW). According to hospital-studies, up to 40% of these deaths could be prevented with Kangaroo Mother Care (KMC), where the baby is kept for several hours every day on the mother’s chest, giving them warmth and access to life-saving breast milk. Almost all evaluations of KMC have been carried out in health facilities. This large randomized controlled trial evaluated KMC initiated in the homes, also called community-initiated KMC (cKMC). The study took place in India, where over one quarter of babies are born with LBW, and included 8,402 LBW babies. Promotion of and support for cKMC increased the survival chances of infants with 25%.



Principal Investigators: Sarmila Mazumder, Sunita Taneja | Co-Principal Investigator: Halvor Sommerfelt

## Biological effects of cKMC

Training mothers in community-initiated Kangaroo Mother Care (cKMC) is an effective way to reduce mortality and morbidity of low birth weight babies. This was a sub-study of CISMACH’s main cKMC trial, investigated pathways with which cKMC can improve infant health and survival.

Principal Investigator: Bireshwar Sinha | Co-Principal Investigators: Nita Bhandari, Halvor Sommerfelt

## Poverty and Equity cKMC

As an extension of the completed trial on the survival benefits of promoting Kangaroo Mother Care at home to low birth weight babies (cKMC), this equity study evaluated the impact on fairness outcomes such as survival benefits for the poorest vs. the less poor and the prevention of catastrophic health care expenditures among the poor in two districts in North India.

Principal Investigators: Tarun Shankar Choudhary, Sarmila Mazumder, Kjell Arne Johansson

## Zinc-Sepsis

Severe infections, including sepsis and severe pneumonia, contribute to almost one quarter of the deaths in infants up to two months of age. Widely accessible and very cheap, we previously showed that a daily dose of zinc given to young infants under antibiotic treatment for “clinical severe infection” increased the success of treatment by 43%. These encouraging results prompted us to do a much larger study in almost 4,000 infants under two months of age to estimate the efficacy of the treatment to prevent death. The study involved hospitals in Nepal and India and its findings are soon to be published.



Principal Investigators: Nitya Wadhwa | Co-Principal Investigator: Tor A Strand

## Zinc Equity

Low-cost health care interventions that prevent impoverishment and catastrophic health expenditures can be valuable national health initiatives. Zinc Equity is a sub-study of the zinc-sepsis trial. It evaluates the health and economic consequences for families of zinc given as an adjunct to standard treatment in young infants hospitalized with “clinical severe infection”. The study will provide information about socio-economic inequalities in infant deaths, cost-effectiveness and financial risk protection.

Principal Investigators: Nitya Wadhwa, Kjell Arne Johansson



## eRegistry and care

The Norwegian Institute of Public Health and the World Health Organization have developed a frame-work tool kits to make it easier for low- and middle-income countries to improve their collection and use of health information to the benefit of women’s and children’s health. This study assessed the benefits of this type of programme in improving the quality of care in rural Bangladesh.



Principal Investigator: J. Frederik Frøen | Co-Principal Investigator: Anisur Rahman

## eRegQual

eRegistries are designed to increase the availability and timely use of routine maternal and child health (MCH) data. The Palestinian National Institute of Public Health, in close collaboration with the Ministry of Health in Palestine, has rolled out an MCH eRegistry. With support from CISMAC, the Norwegian Institute of Public Health caried out a randomized controlled trials with 120 health center in Palestine and assessed how the eRegistry and its interactive checklists and clinical decision support can improve the quality of antenatal care.



Principal Investigator: J. Frederik Frøen | Co-Principal Investigator: Buthaina Ghanem

## BCG

The Bacillus Calmette-Guérin (BCG) vaccine may have non-specific effects in infants, with protection beyond its ability to prevent tuberculosis (TB). In addition, some evidence suggests that giving BCG later in infancy, possibly as a second dose, may enhance its effects. This may be particularly important for HIV-1 exposed infants, i.e. those whose mothers have HIV-1 infection. This study randomized 4,500 HIV-1 exposed Ugandan infants to receive BCG either within 24 hours of being born or at 14 weeks of age. The field part of the study is completed and its findings may impact policies concerning timing of BCG administration in HIV-1 exposed babies.



Principal Investigator: Victoria Nankabirwa | Co-Principal Investigator: Halvor Sommerfelt

## BCG Immunology

The BCG immunology study is a sub-study of the larger BCG trial. The study seeks to provide additional information on the optimal timing of BCG vaccination among HIV-1 exposed infants. Concretely, the substudy will describe possible immunological mechanisms of early vs. late BCG vaccination to improve protection from infectious diseases in these vulnerable babies. The results may also be important for upcoming studies of new vaccines against tuberculosis.

Principal Investigators: Kurt Hanevik, Victoria Nankabirwa

## EcoTime BCG

This study evaluates the cost-effectiveness of giving the BCG vaccine to Ugandan HIV-1-exposed babies at birth or at 14 weeks of age. Combined with possible treatment benefits assessed in the main study, the cost implications of the two vaccination strategies will generate information of relevance to vaccine program development and implementation.

Principal Investigator: Victoria Nankabirwa | Co-Principal Investigator: Bjarne Robbestad  
Master student: Stephen Kabanda

## Chlorhexidine

Infection of the umbilical cord stump (omphalitis) can lead to life threatening generalized infection in the first 28 days of life. The risk of omphalitis is high in low- and middle-income countries. This now completed trial took place in Uganda and involved nearly 5,000 babies of mothers who were not infected with HIV-1. It assesses the effect of a single cleansing of the umbilical cord stump with an antiseptic solution of 4% chlorhexidine in birth facilities on the risk of omphalitis and severe newborn infections.



Principal Investigator: Victoria Nankabirwa | Co-Principal Investigator: Halvor Sommerfelt

## CCF instead of RCT?

This study evaluates whether a novel observational epidemiological study design, the case-control with follow-up (CCF), could be an efficient alternative to randomized controlled trials (RCTs), case-control (CC) studies and cohort studies for investigating the association between exposures and rare outcomes. To find out, we did a CCF and a CC study in parallel with the Chlorhexidine trial in Uganda that measures the association between cleansing of the umbilical cord stump with chlorhexidine on the day of birth and the risk of subsequent severe illness in the newborns.



Principal Investigator: Victoria Nankabirwa | Co-Principal Investigator: Hans Steinsland

## SCALE-8

More than 250 million children living in low- and middle-income countries do not achieve their full development potential. This study followed a previous project assessing the effectiveness, feasibility and cost of integrated early stimulation and nutrition interventions delivered by a government community-based health service in Pakistan. It re-enrolled children at 8 years of age from 80 population clusters to determine which beneficial effects may have endured to school age. The study identifies risks and protective factors that influence outcomes and will inform the development of improved interventions for child development.



Principal Investigator: Muneera A Rasheed | Co-Principal Investigator: Tor A. Strand

## SAFEZT

This three-year project examined global and national policy discourses surrounding fertility control and abortion, as well as local practices and moralities related to these issues among adolescents in Ethiopia, Zambia and Tanzania. The dynamics between the law, policies and access to fertility control and safe abortion services differ between these countries. The project generated comparative knowledge of the interplay between policy, legislation and socio-cultural conditions framing girls’ and women’s reproductive choices.



Principal Investigator: Astrid Blystad | Co-Principal Investigator: Getnet Tadele

## Girl Power

Lack of reproductive health information and lack of economic opportunities may contribute to a high proportion of girls in low- and middle-income countries becoming pregnant at a young age. This study investigated how reproductive health information and entrepreneurship training affect the decision-making of girls when it comes to postponing pregnancy and engaging in economic activities. More than 3,400 female Tanzanian high school pupils from 80 schools across four regions of Tanzania were included in this cluster randomized controlled trial.



Principal Investigator: Bertil Tungodden



## The CAP trial

Low dietary intake of calcium increases the risk of pre-eclampsia and eclampsia, which are serious hypertensive disorders in pregnancy that are dangerous for mother and baby. Although calcium supplementation is recommended by WHO from 20 weeks of pregnancy, no research has evaluated whether starting it before pregnancy can reduce the risk among women with previous pre-eclampsia. This multi-center randomized trial in South Africa, Argentina and Zimbabwe estimated the effect of calcium supplementation before and in the first half of pregnancy on the risk of re-current pre-eclampsia.



Principal Investigator: Justus Hofmeyer

## NeoSupra

Globally, many babies are born too exhausted to breathe spontaneously after birth. Such babies need immediate assistance – otherwise they die. At Mulago Hospital, Kampala, Uganda, we conducted a randomized controlled trial to see if the use of a supraglottic airway device instead of a facemask, which is commonly used for assisted ventilation, can reduce the risk of dying or brain damage in newborns who did not breathe after birth. The now published results are important for low- and middle-resourced settings where many such deaths occur.



Principal Investigators: Thorkild Tylleskär, Josaphat Byamugisha

## Small babies

Babies who are born preterm or at term but small-for-gestational age face high risks of death, of growth failure and of neurodevelopmental deficits in infancy and later in life. The identification of interventions to promote their early catch-up growth and reduce health and development risks is a research priority for scientists and public health policy makers. Responding to this need, CISMAC supports a large on-going randomized controlled trial in India to assess the impact of an integrated health, nutrition, early child stimulation and responsive care intervention package on growth and neurodevelopment in these vulnerable babies.



Principal Investigators: Ranadip Chowdhury, Tor Strand

## MATRISET

Significant weaknesses have been documented in reporting routines and data flow in maternal death reporting, compromising the quality of global maternal mortality data. Under-reporting has been linked to a complexity of social, legal and political factors, including pressure to meet global maternal health goals. The MATRISET project (Research Council of Norway 2021-26) is an interdisciplinary initiative that explores institutional reporting routines, legal frameworks and accountability processes in maternal death surveillance in Ethiopia and Tanzania.



Principal Investigators: Astrid Blystad | Co-Principal investigators: Getnet Tadele (Ethiopia), Ali Said (Tanzania)

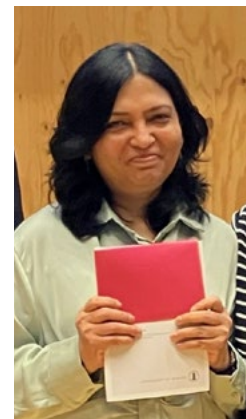


Credit: #225143, Colourbox



# BUILDING FOR THE FUTURE

## SMS reminders not enough to boost antenatal care (ANC) visits and facility births in Bangladesh



We are pleased and proud that Jesmin Pervin defended her PhD degree in 2024.

On Monday, 9 September 2024, **Jesmin Pervin** successfully defended her PhD at the University of Bergen with the dissertation “Targeted Client Communication to Improve Timely Antenatal Care Utilization.” Her research, part of the eRegMat trial in Matlab, Bangladesh, explored whether SMS reminders could boost antenatal care (ANC) visits and facility births. While well-received, the messages did not significantly increase attendance or deliveries, though there was weak evidence of reduced risk of newborn death. In a dynamic defense, Jesmin engaged in discussions on ANC, digital health, and the need for broader interventions. Professors Mats Målqvist and Mirjam Lukasse served as opponents.



Credit both photos: Anne Berit Kolmanskog





Victoria Nankabirwa | Credit: Halvor Sommerfelt

# CISMAC/Centre for International Health Webinars 2024

Throughout 2024, CISMAC arranged several webinars, as we have done since 2018. The webinars are held regularly and are meant for everyone who has an interest in intervention science in maternal and child health or the methods we use. Different topics are presented by scientists affiliated with CISMAC and the Centre for International Health.

In 2024, our webinars covered several topics. Dr. Ranadip Chowdhury presented “Impact of an integrated intervention package during preconception, pregnancy, and early childhood on biomarkers of infant growth in the first 6 months of life: A sub study in WINGS”.

Dr. Monica Kujabi held two webinars covering “Labour progression in urban resource-constrained maternity units - An appeal for change” and “Labour augmentation with oxytocin in low- and lower-middle-income countries”.

Dr. Victoria Nankabirwa and Prof. Halvor Sommerfelt held presentations with results from the analysis of data generated by our two large randomized controlled trials in

Uganda: “Single Cleansing of The Umbilical Cord Stump with Chlorhexidine to Prevent Newborn Infections: A Randomized Controlled Trial in Uganda” and “Human Immunodeficiency Virus Exposure and Risk of Sudden Infant Death Syndrome: A Cohort Study”.

Together with dr. Hanne Keyser Hegdahl and Mweetwa Mudenda, Prof. Ingvild F. Sandøy presented “Economic support, comprehensive sexuality education and community dialogue for girls' empowerment in Zambia”.

Last, but not least, a presentation about “Challenging implications of the politicization of maternal death reporting: Case studies from Tanzania and Ethiopia” was held by Prof. Astrid Blystad and Prof. Karen Marie Moland.



From the webinar held by Prof. Astrid Blystad and Prof. Karen Marie Moland in December 2024.



## STRENGTHENING CAPACITY IN EPIDEMIOLOGY:

# The EpiCap Initiative

CISMAC is committed to advancing maternal and child health through research, education, and capacity strengthening. In line with this mission, we established the EpiCap initiative to enhance the skills and knowledge of epidemiologists in low- and middle-income countries (LMICs) and in Norway.

The initiative aims to foster a new generation of epidemiologists capable of conducting not only high-quality randomized controlled trials but also other analytic epidemiologic studies, to arrive at evidence-based interventions. Further, EpiCap aims to strengthen the researchers' skills as teachers in epidemiology and in effectively communicating their findings to policymakers and health authorities.

During 2024, EpiCap took important steps towards excellence in epidemiological teaching and learning. Striving to build on the legacy of Professor Kenneth J. Rothman, EpiCap has become a cornerstone of CISMAC's efforts to equip researchers with the tools to design, analyze, and interpret studies that address pressing global health needs.

## The Legacy of Professor Kenneth J. Rothman - Building on a Strong Foundation

No discussion of modern epidemiology is complete without acknowledging the profound influence of Professor Rothman, a towering figure in the field. His contributions have importantly shaped the way scientists understand causal inference, and how we should design epidemiological studies as well as analyze their data, and how to interpret the effects we derive from them. His seminal textbook, *Modern Epidemiology*, now in its fourth edition, with other prominent epidemiologists as co-editors, as well the thought-provoking

*Epidemiology – An introduction*, are cornerstones for modern epidemiological research and learning worldwide. His emphasis on clarity, rigor, and transparency will continue to inspire us and generations of researchers, public health professionals as well as clinicians.

Prof. Rothman's connection to CISMAC predates the formal establishment of EpiCap. In 2022, together with Prof. Vera Ehrenstein, he held the course [Conceptual Foundations of Epidemiologic Study Design and Analysis](#). This course and one held by Prof. Matthew A. Fox, [Advanced epidemiology](#), which followed immediately thereafter, demonstrated the power of interactive teaching in epidemiology. Profs. Rothman's, Ehrenstein's and Fox's ability to distil complex concepts into accessible insights inspired us as course participants to shape a pedagogic platform for teaching and learning modern epidemiology, a platform which today defines EpiCap.

## EpiCap expanded its reach and impact through two flagship courses:

### 1. Design and Analysis of Epidemiologic Studies for Causal Inference

This course, held in May 2024 in Bergen by Professor Krista F. G. Huybrechts of the Harvard Medical School and Harvard T. H. Chan School of Public Health, supported by most of EpiCap's 17 Co-facilitators, brought together almost



Profs Arild Raaheim (n. 4 from the left in the back) and Monika Kvernenes (seated 2nd to the right) and Iselin H. Kvamme (seated central) with EpiCap cofacilitators during a workshop on pedagogy in teaching epidemiology in Bergen - February 2024. | Credit: Thorkild Tylleskär

30 participants from India, Pakistan, Ethiopia, Nepal, the Democratic Republic of Congo, Malawi, Tanzania, Finland and Norway. Focusing on the principles of causal inference founded on Prof. Rothman's Sufficient-component cause model as well as on the Counterfactual susceptibility model, Prof. Huybrechts, who co-authored the latest edition of *Epidemiology – An introduction*, elegantly presented key approaches to conceptualize, design, analyze and interpret findings to minimize confounding and other biases. She effectively communicated the importance of critical thinking and transparency in epidemiological research. Before the course, she worked with the Co-facilitators to synchronize

and refine the hands-on exercises they developed for small group afternoon work with the other course participants.

### 2. Advanced Epidemiology

After a preparatory workshop coordinated by Dr. Rizwan Suliankatchi Abdulkader and his team for more than 30 Indian participants at the National Institute of Epidemiology in November 2024 and, again in collaboration with the Indian Council Of Medical Research (ICMR), Prof. Fox, also one of Prof Rothman's students, held a course in Advanced epidemiology in January 2025, in Chennai. The



course, with 31 participants, from the Democratic Republic of Congo, India, Nepal, Norway, and Ethiopia and, again, with active participation from EpiCap’s 14 Co-facilitators, delved into cutting-edge epidemiologic methods. In small groups of 2-4 students per Co-facilitator, participants gained practical experience when doing stratified and regression analyses to adjust for confounding, quantitatively correct for information bias and quantify interaction. These hands-on exercises also covered more advanced topics such as

the Counterfactual susceptibility model and propensity score matching. The course culminated in a gathering where Dr. Rajiv Bahl, the Director General of the ICMR and Secretary, Department of Health Research, Ministry of Health in India, bestowed diplomas on participants and Co-facilitators. Dr. Bahl played an important role in conceptualizing and establishing CISMACH as a Centre of Excellence and is an honorary doctor of the University of Bergen.

These EpiCap courses underscore CISMACH’s commitment to foster a deeper understanding of epidemiology to enhance study quality and validity to inform public health action to improve maternal and child health in LMICs.

Learning Through Teaching: The Role of EpiCap Co-facilitators

EpiCap emphasizes active learning through teaching. Its Co-facilitators—many of whom are early- to mid-career researchers—play a dual role: they guide participants through complex concepts while simultaneously deepening their own understanding through preparation and academic discussions. This approach, rooted in modern pedagogical principles, reflects the philosophy that teaching is not merely a transfer of knowledge but a dynamic process of mutual learning. The pedagogical foundation of EpiCap draws inspiration from the work of Professor Arild Raaheim, a pioneer in modern pedagogy with its active learning methods. Prof. Raaheim’s and Associate Professor Monika Kvernenes held a workshop for the Co-facilitators in February 2024 where they emphasized the importance of “learning by doing” and sensitized Co-facilitators to other aspects of modern pedagogy, aligning our initiative with CISMACH’s vision of active participation. EpiCap’s Co-facilitators learn by engaging with their mentors, including Drs. Rothman, Huybrechts, Fox and Bahl, with each other as well as with course participants, where they tackle learning obstacles, challenge assumptions, and refine their own understanding of epidemiological concepts. This iterative process not only enhances their expertise but fosters a collaborative and inclusive learning and research environment.

Looking Ahead

EpiCap’s extensive activities in 2024 is a testament to the enduring influence of its mentors in Boston and India, the innovative pedagogical approaches endorsed by Profs.

Raaheim and Kvernenes, the dedication of CISMACH’s other faculty members and partners, and last but not the least, EpiCap’s Co-facilitators. As we look to the future, we remain committed to expanding EpiCap’s reach and, resources allowing, will ensure that researchers linked to CISMACH, the Centre for International Health, Department of Global Public Health and Primary Care as well as our partners can benefit from having better tools and knowledge to effectively study health challenges and identify means to overcome them.

Now that the three core courses have been completed with contribution from 13 of the Co-facilitators, they will actively take part to those of our upcoming courses that they deem most relevant in them, including the course in Advanced statistics in epidemiology by Professor Håkon K. Gjessing, one of Scandinavia’s leading biostatisticians. They will also

be invited to take part in and contribute to Prof. Kåre Mølbak’s course in Outbreak investigation. Prof. Mølbak is one of Denmark’s most prominent epidemiologists and was in charge of modelling the Danish COVID-19 epidemic and was the senior advisor to Denmark’s government on measures to contain it.

Prof. Rothman’s legacy reminds us that epidemiology is not just about numbers—it’s about understanding the people and their health issues which give rise to our data, and using that understanding to improve lives. To distil quotes from Profs. Fox and Huybrechts: “Epidemiology is all about generating valid effect estimates with high statistical precision so that public health policy makers, clinicians and other health workers can, based on solid evidence, act to promote health and well-being for all”.



Portable display stand for the course “Design and analysis of Epidemiologic Studies for Causal Inference” held at the National Institute of Epidemiology in Chennai in November 2024. | Credit: Halvor Sommerfelt



Prof. Krista Huybrechts, EpiCap Co-facilitators and participants in the course “Design and Analysis of Epidemiologic Studies for Causal Inference” in Bergen - May 2024. | Credit: Thorkild Tylleskär



# MANAGEMENT & PUBLICATIONS

## CISMAC MANAGEMENT AND ADMINISTRATION



**Halvor Sommerfelt**  
Director



**Ingvild F Sandøy**  
Deputy Director



**Jose Martines**  
Scientific Coordinator



**Iselin Henriksen Kvamme**  
Administrative Leader



**Filiz Ipek**  
Economy



**Anne Berit Kolmanskog**  
Project administration



**Gunhild Koldal**  
Project administration



**Ricky Heggheim**  
Web and communication



# LIST OF SCIENTIFIC PUBLICATIONS IN 2024

Bakken, Kjersti Sletten; Niraula, Apeksha; Chandyo, Ram K; Ulak, Manjeswori; Shrestha, Laxman; Sharma, Vijay Kumar; Strand, Tor A.; Korevaar, Tim I M. **“Reference Ranges and Determinants of Thyroid Function and TSH Receptor Antibodies During Early Pregnancy in Nepal”**. Clin Endocrinol (Oxf.), 2024 Dec 16.

Bhutada, Kiran; Venkateswaran, Mahima; Atim, Maureen; Munabi-Babigumira, Susan; Nankabirwa, Victoria; Nama-gembe, Flavia; Frøen, J Frederik; Papadopoulou, Eleni. (2024). **“Factors influencing the uptake of antenatal care in Uganda: a mixed methods systematic review”**. BMC Pregnancy and Childbirth, 2024 Nov 8;24(1):730.

Bwanga, Freddie; Mukashyaka, Claudine; Kateete, David Patrick; Tumuhamy, Josephine; Okeng, Alfred; Aboce, Emma-nuel; Namugga, Olive; Kwizera, Richard; Sommerfelt, Halvor and Nankabirwa, Victoria. **“Vaginal colonization with virulent and methicillin resistant Staphylococcus aureus among Ugan-dan women in Labour”**. BMC Microbiology (2024) 24:307 <https://doi.org/10.1186/s12866-024-03460-9>.

Chowdhury, R., Manapurath, R., Sandøy, I. F., Upadhyay, R. P., Dhabhai, N., Shaikh, S., Chellani, H ... & Taneja, S. (2024). **“Impact of an integrated health, nutrition, and early child stimulation and responsive care intervention package delivered to preterm or term small for gestational age babies during infancy on growth and neurodevelopment: study protocol of an individually randomized controlled trial in India (Small Babies Trial)”**. Current controlled trials in cardiovascular medicine, 2024-02, Vol.25 (1), p.110-110.

Flaherman, Valerie J.; Murungi, Joan; Bale, Carlito; Dickinson, Stephanie; Chen, Xiwei; Namiiro, Flavia; Nankunda, Jolly Ka-haruza; Pollack, Lance M.; Laleau, Victoria; Kim, Mi-Ok; Alli-son, David B.; Ginsburg, Amy Sarah; Braima de Sa, Augusto; Nankabirwa, Victoria. **“Breastfeeding and Once-Daily Small-Volume Formula Supplementation to Prevent Infant Growth Impairment”**. Pediatrics (2024) 153 (1): e2023062228.

Hookham, Lauren ; Cantrell, Liberty ; Cose, Stephen ; Freyne, Bridget ; Gadama, Luis ; Imede, Esther ; Kawaza, Kondwani ; Lissauer, Samantha ; Musoke, Phillipa ; Nankabirwa, Victoria ; Sekikubo, Musa ; Sommerfelt, Halvor ; Voysey, Merryn ; Le Doare, Kirsty. (2024). **“Seroepidemiology of SARS-CoV-2 in a cohort of pregnant women and their infants in Uganda and Malawi”**. PloS one, 2024-03, Vol.19 (3), p.e0290913-e0290913.

Kidanemariam, Mulu Beyene; Miljeteig, Ingrid; Moland, Karen Marie Ingeborg; Melberg, Andrea. **“Legal issues in the implementation of Maternal Death Surveillance and Response: a scoping review”**. Health Policy and planning, 2024 Oct 15;39(9):985-999.

Kvestad, Ingrid ; Ulak, Manjeswori ; Ranjitkar, Suman ; Shrestha, Merina ; Chandyo, Ram K ; Guedeney, Antoine ; Braarud, Hanne C ; Hysing, Mari ; Strand, Tor A. (2024) **“Social withdrawal behaviour in Nepalese infants and the re-lationship with future neurodevelopment; A longitudinal cohort study”**. BMC pediatrics, 2024-03, Vol.24 (1), p.195-195, Article 195.

Long, Kurt Z.; Gunanti, Inong R.; Stride, Chris; Sanchez, Johanna; Sur, Dipika; Manna, Byomkesh; Ramamurthy, Thandavarayan; Kanungo, Suman; Nataro, James P.; Powell, Helen; Roose, Anna; Nasrin, Dilruba; Sommerfelt, Halvor; Levine, Myron and Kotloff, Karen. **“Identification of Enteric Pathogen Reservoirs and Transmission Pathways Associated with Short Childhood Stature in the Kolkata Indian Site of the Global Enteric Multicenter Study”**. Nutrients 2024, 16(16), 2733; <https://doi.org/10.3390/nu16162733>.

Mori, Amani Thomas ; Mudenda, Mweetwa ; Robberstad, Bjarne ; Johansson, Kjell Arne ; Kampata, Linda ; Musonda, Patrick ; Sandoy, Ingvild. (2024) **“Impact of cash transfer programs on healthcare utilization and catastrophic health expenditures in rural Zambia: a cluster randomized con-trolled trial”** Frontiers in health services, 2024-04, Vol.4, p.1254195-1254195.

Mulubwa, Chama; Zulu, Joseph Mumba; Hurtig, Anna-Karin; Goicolea, Isabel. (2024) **“Being both a grandmother and a health worker: experiences of community-based health workers in addressing adolescents’ sexual and reproductive health needs in rural Zambia”** BMC Public health, 2024 May 3;24(1):1228.

Rasheed, Muneera A.; Nilsen, Sondre Aasen; Strand, Tor A.; Shaheen, Fariha; Kvestad, Ingrid.(2024). **“Is home environ-ment associated with child fluid reasoning abilities in middle childhood in high-risk settings? findings from a cross-sectional study in Pakistan”**. BMC Pediatr 24, 638 (2024).

Sandøy, Ingvild Fossgard; Mudenda, Mweetwa; Hegdahl, Hanne Keyser; Zulu, Joseph Mumba; Grønvik, Taran; Mun-saka, Ecloss; Jacobs, Choolwe; Svanemyr, Joar; Tungodden, Bertil; Blystad, Astrid; Olowski, Linda K.; Makasa, Mpundu Chikoya; Moland, Karen Marie; Mæstad, Ottar; Mori, Amani Thomas; Fylkesnes, Knut Martin; Musonda, Patrick. (2024) **“Effectiveness of economic support, comprehensive sexual-ity education and community dialogue on early childbearing and sitting for grade nine exams among adolescent girls in rural Zambia: a cluster randomised trial”**. eClinicalMedicine, Volume 78, 102934.

Strand, T. A., McCann, A., Kvestad, I., Chandyo, R. K. (2024). **“Vitamin B<sub>12</sub> deficiency in pregnant women – Authors’ reply”**. The Lancet, volume 403, Issue 10435. P1450.

Svanemyr, Joar; Zulu, Joseph Mumba; Mundaka, Ecloss; Sandøy, Ingvild Fossgard. **“Lessons from an intervention study on the sustainability of after-school comprehensive sexuality education in Zambia: the perspectives of teachers, health workers and guardians”**. Reprod Health, 2024 Dec 18;21(1):191.

Venkateswaran, Mahima; Pervin, Jesmin; Dolphyne, Akuba; Friberg, Ingrid K.; Fjeldheim, Ingvild J.; Frøen, Fredrik; Khatun, Fatema; O’Donnell, Brian; Rahman, Monjur; Rahman, A.m. Quaiyum; Nu, U Tin; Rose; Christopher James; Sarker, Bidhan Krishna and Rahman, Anisur. (2024). **“eRegMat – a digital registry for improved quality of antenatal care: a cluster-randomized trial in a rural area in Bangladesh”**. BMC Digital Health. Volume 2, article number 5, (2024).

Photo this page:  
Panoramic image of landscape of Lake Mburo  
National Park, Uganda  
Credit: by Alexander Ludwig | Colourbox



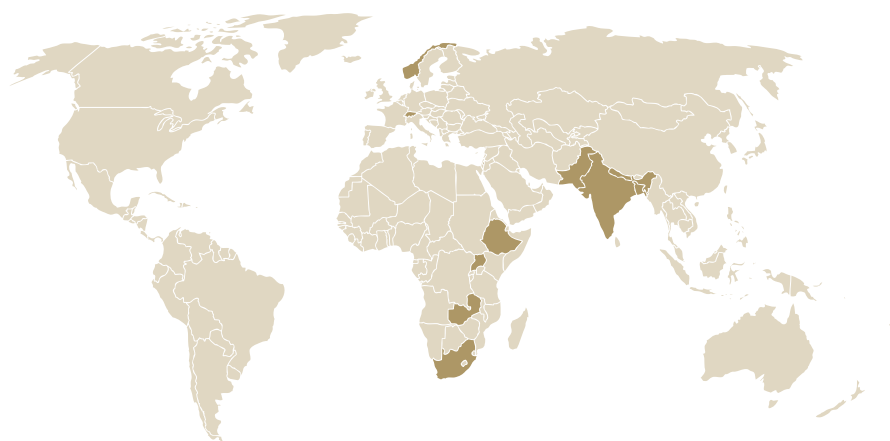


Children in Uganda. Credit: Alexander Ludwig | Pernille Bering, Colourbox

**Content:**  
Halvor Sommerfelt, Ingvild F. Sandoy, Iselin  
Henriksen Kvamme, José Carlos Martines ,  
Ricky Heggheim, Mahima Venkateswaran  
**Template design:**  
Margareth Haugen, Communication Division, UIB  
**Design:** Aksell



## CISMAC Partner Countries



TOWARDS A BRIGHTER FUTURE FOR MOTHERS AND CHILDREN

**[uib.no/en/cismac](http://uib.no/en/cismac)**



**CENTRE FOR INTERVENTION SCIENCE IN MATERNAL AND CHILD HEALTH (CISMAC)**

is anchored at the Centre for International Health (CIH), IGS, University of Bergen, Norway. CISMAC is a consortium of CIH and research institutions in Ethiopia, India, Nepal, South Africa, Uganda, Zambia, Pakistan, Bangladesh and Palestine. The consortium also includes Chr. Michelsen Institute, the Norwegian Institute of Public Health, Innlandet Hospital Trust and the World Health Organization.

**Email: [cismac@uib.no](mailto:cismac@uib.no)**