



ANNUAL REPORT 2014



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FROM THE EXECUTIVE COMMITTEE

The establishment of the Centre for Intervention Science in Maternal and Child Health (CISMAC) in 2013 was a recognition that research on effective interventions and their equitable delivery can make a major contribution to improve maternal and child health in low and middle income countries (LMIC). Systematic assessment of the literature over the past ten years¹ shows that the majority of maternal, newborn and child deaths in LMIC can be prevented. Maternal and child health and development can be considerably improved if all mothers and children receive health interventions we already know are effective are put to scale. Interventions not considered to be health oriented can also contribute importantly to improve maternal and child health and development; among these improving access to secondary education for adolescent girls, may prove highly effective, and would simultaneously contribute to gender equality. Research is needed to improve such interventions, simplify their delivery and identify better ways to reach a high and equitable coverage². Research is also required to identify new strategies to improve maternal and child health and development. By undertaking high quality interventions studies and strengthen capacity at collaborating institutions, CISMAC's vision is to contribute to these goals.

In 2014, CISMAC directed its efforts to three fronts by:

- (1) establishing the administrative procedures required for the effective support of high quality research Studies and maximizing their benefits;
- (2) facilitating the development of high quality Study protocols and initiating Study implementation; and
- (3) interacting with the international health community to contribute to the identification of research priorities and the implementation of important studies.

CISMAC played an active role in international efforts to set the research agenda for newborn and child health. CISMAC scientists were part of the group of experts that worked with the WHO and UNICEF and the Gates Foundation to identify research priorities for newborn health and for the improved management of diarrheal diseases. As part of these efforts, they supported the process of collecting and prioritizing relevant questions from a large group of experts, and took part in the international consultations that completed the processes. Two publications in *The Lancet*, co-authored by CISMAC staff, reflected the work on newborn health. The work on the identification of the priorities for diarrheal diseases management has led not only to the identification of priority questions but also to recommendations of study designs that should be used to address these questions. Collaboration between the WHO and the Bill and Melinda Gates Foundation will ensure that the highest priority questions will quickly turn into funded studies.

“

ACCESS TO EDUCATION
FOR GIRLS CAN IMPROVE
MATERNAL AND CHILD HEALTH.

From the Executive Committee

¹ who.int/maternal_child_adolescent/documents/lancet_child_survival/en
who.int/maternal_child_adolescent/documents/lancet_neonatal_survival/en
thelancet.com/series/maternal-and-child-nutrition
thelancet.com/series/everynewborn

² who.int/maternal_child_adolescent/documents/9789241598651/en

In 2014 we strengthened our Consortium in the area of health economics and behavioral economic research with the signing of a bilateral agreement with Chr. Michelsen Institute (CMI). The Norwegian Institute of Public Health (NIPH) team, a partner since the signature of the Consortium Agreement in 2013, continued its research and technical development in registry and data collection methodologies. The Centre for International health (CIH) at the University of Bergen, which hosts CISMAC Management, NIPH and the Department of Maternal, Newborn, Child and Adolescent Health of the WHO supported CISMAC in the development and review of Study protocols.

In September 2014, we held the first meeting of our Strategic and Scientific Advisory Committee. Following its advice, and with support from our Board, we are further developing CISMAC's strategy in 2015. In December 2014, we prepared new grant applications for submission in February 2015. This is a reflection of our strategy to generate sufficient additional resources for high-quality implementation of our Studies and to expand our Study portfolio. We ended 2014 with the expectation to publish trial protocols, findings from formative research, analyses of data from already completed earlier studies, and new literature reviews in the coming year. This will give us the opportunity to share early results from CISMAC scientists' work with the international community.

Bergen, Geneva and New Delhi, March 27th, 2015




Halvor Sommerfelt,
Director




Ingvild F. Sandøy
Deputy Director




José Martines,
Scientific Coordinator




Maharaj K. Bhan,
Chair, Technical Advisory Group

2014 – CONSOLIDATING CISMAC

Following the creation of the consortium in September 2013, the first months of 2014 saw the formulation of general CISMAC guides, instruments and procedures for Study support. This work was informed by the review procedures of successful funding agencies and research groups as well as through discussions with our Partners. Mechanisms to enhance Study relevance and implementation quality include systematic reviews and expert consultations for protocol development; the application of internationally agreed standards for protocol presentation; and the creation of a system for engaging international experts in the peer review of CISMAC protocols. CISMAC Management developed systems to both promote and ensure quality during implementation, combining frequent interaction with investigators, provision of support in problem-solving and monitoring of progress. Finally, CISMAC entered into contractual agreements with implementing institutions, established periodic reporting mechanisms and is developing a strategy for support to data analysis and write-up of scientific papers.

During 2014, five of the six Studies initially planned by CISMAC were initiated. These studies address questions that the WHO and international experts have identified as being of high priority.

They include:

- Supporting adolescent girls and their families, in part by promoting secondary education of young girls, to prevent adolescent pregnancies.
- Improving the coverage of mother and baby care in the 24 hours around birth, the period of highest risk of death for mothers and infants.
- Evaluating the safety and benefit of promoting Kangaroo Mother Care in the community for babies born with low birth weight, many of whom are premature.
- Evaluating the effect of supplementation with vitamin B12 to pregnant women on cognitive function in early childhood.
- Evaluating the effect of delaying BCG vaccination in HIV-exposed but uninfected infants.

To support the Study teams in the implementation of their research plans, CISMAC organized, in collaboration with the CIH, the workshop «From Concept to Study». The workshop was held in Bergen in September 2014. During the workshop the Study teams exchanged experiences on the development of study protocols and Standard Operating Procedures, on implementation and mechanisms to improve quality. Video recordings of the sessions allow us to expand access to the information to members of the teams who were unable to participate in the workshop. The workshop also contained a session on advanced statistical methods in intervention science.

In 2014, CISMAC was successful in raising additional resources in support of the Studies it prioritized. The application to GLOBVAC for the Study entitled «Zinc as an adjunct for the treatment of very severe disease in infants younger than 2 months», submitted by CIH-UiB and the Indian CISMAC partner Translational Health Science and Technology Institute, was granted 18.4 mill NOK. CISMAC researcher Victoria Nankabirwa obtained from GLOBVAC a «Young Investigator grant» to estimate the effect of cleansing the umbilical cord stump of Ugandan newborns with chlorhexidine. The NIPH secured funding from GLOBVAC, the Norwegian Ministry of Foreign Affairs and the Norwegian Agency for Development Cooperation for trials to assess the feasibility and effectiveness of electronic health registries in reproductive, maternal, newborn and child health services in Palestine.



ABOVE: FIELDWORKER CONDUCTING A HOME-VISIT IN INDIA.
BELOW: FIELDWORKERS LEAVING FOR DATA COLLECTION.



CISMAC STUDIES

DELAYED BCG VACCINATION IN HIV-EXPOSED UNINFECTED INFANTS IN UGANDA:

Observational studies indicate that BCG vaccination can protect infants against several serious infections in addition to tuberculosis. Such non-specific effects are now receiving increased attention. The literature on non-specific effects is, however, fraught with controversies; it has for example been argued that children with relatively low morbidity and mortality are more likely to be vaccinated than higher risk children, resulting in a spurious non-specific protective effect of BCG. Because HIV-infected infants have a substantially increased risk of disseminated BCG infection, recent World Health Organization (WHO) guidelines consider HIV infection a contra-indication to BCG vaccination. However, practical implementation of this guideline is difficult because HIV diagnosis at birth (when the vaccine is to be given) is not possible in many low and middle income countries (LMIC). As a result, most HIV-exposed infants, including those yet to be diagnosed as having an HIV infection, continue to receive BCG. To circumvent this, it has been suggested that HIV exposed babies receive BCG after the absence of HIV infection is confirmed.



Randomized controlled trials (RCTs) are required to inform the development of strategies for BCG vaccination, also in HIV exposed babies. Our study will therefore estimate the extent to which deferring BCG vaccination from birth to 14 weeks of age changes immune responses to BCG and the risk of serious illness during infancy in such babies. The Study Project Management Team has developed a protocol which is now undergoing its second CISMAC review by external experts. If the trial plans are approved by the Ugandan and Norwegian ethics committees, an RCT will be implemented, anchored at Makerere University in Kampala. Recruitment will take place at up to 6 birth facilities in and around Kampala in Uganda. We expect that the trial findings will inform strategies for appropriate vaccination of HIV exposed infants in Africa.

EDUCATION AND OTHER APPROACHES TO EMPOWER ADOLESCENT GIRLS TO REDUCE TEENAGE CHILDBEARING IN ZAMBIA:

Studies in LMICs show a positive association between low levels of education and risky sexual behavior, early marriage and pregnancies among adolescents. Teenage pregnancies are associated with high risk of preterm birth, and unplanned pregnancies may be terminated by unsafe abortion, an important cause of maternal death. Increasing age of first pregnancy and birth is therefore likely to translate into improved maternal and child health and survival. Pregnancy rates are particularly high among girls who are out-of-school. However, with a current participation rate in secondary school at only 35%, efforts to prevent early marriage and childbearing need to reach girls both in- and out-of-school. After consultations with Zambian and international stakeholders, the Study team developed a protocol for formative research that went through internal and external peer review. After obtaining the necessary ethical clearances in Zambia and Norway, the investigators are now carrying out formative research to inform the development of the prototype intervention packages (see also description on p.20). The multidisciplinary Study team includes researchers from the University of Zambia, the Centre for International Health (CIH) - UiB, Chr. Michelsen Institute (CMI), and the Norwegian School of Economics. The findings of the pilot study will be used to refine the intervention package(s) that are to be evaluated in an RCT.



IMPACT OF KANGAROO MOTHER CARE (KMC) WITH SUPPORT FOR LOW BIRTH WEIGHT INFANTS IN INDIA:

Low birth weight infants account for 60-80% of all neonatal deaths. However, over 75% of deaths among these infants could be prevented even without access to intensive care. Providing low birth weight babies with the necessary care in the community could make a major contribution to reducing neonatal and thereby infant mortality. This is particularly important in India, where more than 25% of infants are born with low birth weight. This study aims to develop and evaluate an intervention package based on the promotion of KMC in the community. It is being developed in collaboration with WHO's Department of Maternal, Newborn, Child and Adolescent Health, and will be conducted in two stages. The first stage consists of formative research to develop an intervention package and pilot it to assess its acceptability among mothers of low birth weight babies. The second stage will be an RCT to ascertain the impact of community based KMC on survival of these babies during the neonatal period and in the first 6 months of life. Having received the necessary ethical clearances in India and Norway, the Study team, anchored at the Society for Applied Studies in New Delhi, is currently undertaking the formative research. Its findings will define the intervention package they will develop and subsequently pilot.



INCREASING COVERAGE OF POSTNATAL CARE ON THE FIRST DAY AFTER BIRTH BY IMPROVING HEALTH SYSTEMS PERFORMANCE IN INDIA:

Almost half of newborn deaths in LMICs occur on the first day after birth. Reaching newborns with improved care in this critical period can bring major improvements in survival and child health. Unfortunately, care coverage on the first day is low. The aim of this study is to find an effective way to increase the coverage and the quality of care provided to newborns in the first 24 hours after birth. This Study is also anchored at the Society for Applied Studies. Currently the Study protocol is being developed. The researchers have explored various mechanisms to ensure regular contact with mothers during pregnancy and are developing interventions to increase the access to care for pregnant women and their newborns in the critical period around birth and in the first 24 hours after it. The intervention will use a call-centre and social agents to support pregnant women and their families to access services from appropriate facilities in the period around birth and to help provide improved early home care to the newborns.



For both studies in India, a close interaction has been established with the Government of the State of Haryana, where the trials will be conducted. The interaction with the Government is essential for implementing the Studies and for translating their findings into policy and action.

SUPPLEMENTATION WITH HIGH DOSES OF VITAMIN B12 IN PREGNANCY TO IMPROVE COGNITIVE FUNCTIONING IN EARLY CHILDHOOD IN NEPAL:

Many women and children in LMIC have inadequate vitamin B12 stores. This vitamin is crucial for normal cell division and differentiation, and vitamin B12 deficiency may be associated with impaired fetal growth, premature birth as well as suboptimal brain development and function. Poor vitamin B12 status is common in people on vegetarian diets. The Study team will administer vitamin B12 or a placebo to 1,600 pregnant women in Nepal and then follow their children up through their early childhood. Field workers and supervisors have been recruited at the site in Bhaktapur in Nepal's Kathmandu valley and training for cognitive assessment and use of equipment has initiated. A workshop was held to discuss the protocol and to train key researchers in the use of some of the Study instruments. The team of fieldworkers, supervisors, psychologists and researchers is currently field testing and standardizing these instruments while further developing the protocol.



ZINC AS AN ADJUNCT FOR THE TREATMENT OF VERY SEVERE DISEASE IN YOUNG INFANTS:

The prognosis of sepsis in early infancy is poor and neonatal sepsis is an important contributor to neonatal and thereby infant mortality in LMIC. In a recent RCT in India which was anchored at the Translational Health Science and Technology Institute (THSTI), CISMAC researchers found that adjunct treatment with orally administered zinc had an efficacy of 40% against treatment failure in 7-120 days old infants with probable serious bacterial infection. The trial was not powered to estimate the effect on the babies' case fatality risk. A proposal for a study large enough to estimate a reduction in case fatality risk has recently obtained funding from the Research Council of Norway. The Project Management Team proposed this multi-hospital trial in India and Nepal for inclusion in the CISMAC portfolio. The RCT will be anchored at the CISMAC partners THSTI in India and Institute of Medicine, Tribhuvan University in Nepal. Zinc is inexpensive and widely accessible. Should the intervention prove to be effective in increasing the survival chances of these vulnerable babies, the Study will have a significant weight in supporting the formulation of an improved treatment of sepsis and its incorporation into policy, thereby contributing to enhanced survival of young infants in LMIC.





PUBLICATIONS BY CISMAC RESEARCHERS

NEWBORN HEALTH

The Lancet published in May 2014 a series of 5 papers on newborn health. Two of the papers, [Newborn health research priorities beyond 2015](#) and [Who has been caring for the baby?](#) were co-authored by CISMAC's Scientific Coordinator José Martines.

ESTABLISHING NEWBORN HEALTH RESEARCH PRIORITIES

Several CISMAC and CIH researchers were part of a team that worked with the WHO to establish evidence-based research priorities for reducing mortality among newborn babies and children post 2015. The effort addressed the question of how to establish research priorities that are both evidence-based and represent a consensus from the global research community. They adapted and used a method developed by the [Child Health and Nutrition Research Initiative \(CHNRI\)](#) In brief, the team identified a pool of experts and asked a large and representative sample to submit their 3 best research ideas. These ideas were collated into a list of questions that were sent to the expert pool for scoring against a set of 5 predefined criteria. Analyses of the responses identified priorities in 3 research domains of interventions to improve newborn health and survival: discovery, development and delivery.

The authors of the paper [Newborn health research priorities beyond 2015](#) challenged the international community to invest so that the top-ranked research priorities they identified are further evaluated and supported for implementation. They argued that implementation of these research priorities will accelerate progress in newborn health and result in an improvement of what is essentially our collective human capital worldwide. CISMAC is currently supporting studies that address some of the top research priorities identified by this paper.

SETTING NEWBORN HEALTH ON GLOBAL HEALTH AGENDAS

Preterm birth and neonatal problems are globally the most important causes of death and disability in children – constituting over 10% of the [Global Burden of Disease](#). Yet, as recently as the 1990's there was hardly any mention of neonatal deaths in official statistics or publications. Neonatal care and death prevention were not seen as being a viable, cost-effective health priority for low-income countries.

However, research has shown that it is, in fact, a myth that improving newborn health and survival requires high-tech and prohibitively expensive interventions. Simple, effective, low-cost solutions exist. A number of these inexpensive measures can lead to substantial improvements in neonatal care and survival.

The paper "[Who has been caring for the baby?](#)" notes that, despite some increased visibility of neonatal health issues in the last decade, stillbirths remain largely neglected in research, advocacy, policy, and programme action, despite the case presented in the Lancet Stillbirths Series. The estimated 1.2 million stillbirths occurring during delivery are the largest burden for deaths at birth, and this rate might be the most sensitive indicator of quality of a country's health system. Agenda-setting and policy-formulation now routinely use 'maternal, newborn and child health' as their standard, instead of 'maternal and child health'. Newborn health is now widely recognized as a crucial element of the reproductive, maternal, newborn and

child health and nutrition continuum of care. The authors underline that it remains a myth, however, that investment in maternal and child health will have an automatic trickle-down effect on newborn health, and urge that neonatal health issues receive their own prioritized funding, agenda setting and policy formation. They conclude by noting that action, amount of intervention, and information is variable between regions and countries, as well as within countries. Initiatives are frequently dependent on the efforts of individual leaders. The paper wraps up with information about the many opportunities there are for engagement and action to improve newborn health. CISMAC contributes to this effort by prioritizing research on simple, effective, low-cost solutions that can significantly improve newborn health.

Read the full articles here:

Newborn health research priorities beyond 2015

Yoshida S, Rudan I, Lawn JE, Wall S, Souza JP, Martines J, Bahl R; neonatal health research priority setting group. Lancet. 2014 Jul 12

Who has been caring for the baby?

Darmstadt GL, Kinney MV, Chopra M, Cousens S, Kak L, Paul VK, Martines J, Bhutta ZA, Lawn JE; Lancet Every Newborn Study Group. Lancet. 2014 Jul 12



GOING THE LAST MILE IN CHILD SURVIVAL IN INDIA

Despite targeted public health efforts, nearly 18,000 children under the age of 5 years die every day in India, more than in any other country in the world. The neonatal period, especially the first 24 hours of life, is an extremely precarious time that accounts for more than 40% of all childhood deaths. In addition, there are almost 2,000 stillbirths every day, many of whom could have lived if better maternal and obstetric care were available. The knowledge and technologies to prevent or treat the most common reasons for the stillbirths and neonatal deaths have already been established, but are not sufficiently used.

The difficult final hurdle is to get parents and local communities to use this knowledge, and to give them greater access to quality healthcare.

SIGNS OF SICKNESS ARE NOT DETECTED

Many children do not receive appropriate and timely health care. There are many reasons for this; often the child is born at home, frequently the baby has a low birth weight, and it can be difficult for the families to recognize the subtle signs of severe sickness in their newborns. This means that treatment is often sought too late. If the family does seek treatment, it is often from a private provider who is not medically qualified.

AN INITIATIVE TO IMPROVE NEWBORN AND CHILD CARE

The WHO Integrated Management of Childhood Illnesses (IMCI) was launched in the early 1990s. The strategy aims to help early recognition of childhood illnesses by the family, to enhance linkages between families, communities and health facilities, and to increase prompt and appropriate treatment delivered through strengthened health infrastructure.

India adapted IMCI by adding a neonatal component, renaming it the Integrated Management of Neonatal and Childhood Illness (IMNCI). Implementation of IMNCI in India started in 2003. Our researchers earlier [evaluated the strategy in a large cluster randomized trial](#) and found that it reduced infant mortality by 15%. The neonatal component focused on promoting essential newborn care through home visits in the first week of life, and community mobilization to reach every newborn. Through this approach, IMNCI aims to improve early recognition and better treatment-seeking for sick newborns and children.

THE TRIAL FOLLOWED
78,000 PREGNANT
WOMEN, IDENTIFIED
1500 STILLBIRTHS AND
ENROLLED ALMOST
61,000 NEWBORNS.

MORE THAN 60 000 NEWBORNS ENROLLED IN THE STUDY

The study Effect of implementation of Integrated Management of Neonatal and Childhood Illness programme on treatment seeking practices for morbidities in infants: cluster randomised trial was conducted in Haryana in India, in a group of villages with a total population of 1.1 million. The aim of the study was to determine the effect of IMNCI on both treatment-seeking practices and on neonatal and infant morbidity. The study was implemented from January 2007 to April 2010. The trial followed almost 78,000 pregnant women, identified 1,500 stillbirths and enrolled almost 61,000 newborns, about half of them in the areas where the IMNCI strategy was implemented.

WHAT DOES IMNCI INCLUDE?

IMNCI includes three areas of focus directly linked to the provision of health care for infants.

Home visits during the newborn period

Community health workers were trained to conduct home visits and counsel mothers. During visits they would promote optimal newborn care practices, identify and treat illnesses, and refer sick newborns to health centres or hospitals.

Improved case management of sick children

Community health workers and physicians were trained to improve their skills for the case management of sick children under 5 years old.

Strengthening of health systems

The Health system was strengthened through improved supervision of community health workers, provision of performance-based incentives, and ensuring regular supplies of essential medicines. Women's group meetings were conducted every three months in each village to improve community awareness about the available services.

INTERVIEWS IN THE HOMES OF THE CHILDREN

An independent team of research assistants carried out interviews with mothers in intervention and control areas to assess the main study outcomes.

The results indicated significant improvements in the intervention areas when compared with the control areas:

- Treatment for severe neonatal illness, for local neonatal infection, for diarrhoea and pneumonia was sought more often from an appropriate provider
- Mothers reported fewer episodes of severe neonatal illness and also lower prevalence of diarrhoea and pneumonia
- Infants were more likely to still be exclusively breastfed in the sixth month of life

Other results included improvement in home based newborn care practices such as starting breastfeeding within one hour of birth, exclusive breastfeeding at 4 weeks, delayed bathing, and appropriate cord care, all of which improved substantially in the intervention clusters.

A SUCCESSFUL PROGRAMME

The study concluded that large scale implementation of the Integrated Management of Neonatal and Childhood Illness strategy is effective in improving treatment-seeking practices, such as timely treatment-seeking from appropriate providers, as well as in reducing morbidity and mortality. The scale-up of the program has most likely contributed significantly to the enhancement of child survival and improvement of health that has been observed after the implementation of IMNCI in this part of India.

Read the full article:

[**Effect of implementation of Integrated Management of Neonatal and Childhood Illness programme on treatment seeking practices for morbidities in infants: cluster randomised trial.**](#)

Mazumder S, Taneja S, Bahl R, Mohan P, Strand TA, Sommerfelt H, Kirkwood BR, Goyal N, Van Den Hombergh H, Martines J, Bhandari N; on behalf of the Integrated Management of Neonatal and Childhood Illness Evaluation Study Group. *BMJ*. 2014 Aug

Read comment from BMJ Editor on the study here:

[**Going the last mile in child survival in India**](#)

The IMNCI trial was completed before CISMAC was born, and serves as an example of the type of high quality highly relevant Studies that CISMAC is now embarking on.



CAN VITAMIN A SUPPLEMENTS HELP IMPROVE CHILD SURVIVAL?

About 6.9 million children younger than 5 years die every year worldwide; 43% of these deaths occur within the first 4 weeks of life, the neonatal period. A quarter of all neonatal deaths in the world occur in India alone.

HOW TO REACH MDG4?

There is an urgent need to identify ways to accelerate reductions in neonatal and infant mortality to achieve Millennium Development Goal 4, which aims to reduce child mortality by two-thirds between 1990 and 2015. Could neonatal Vitamin A supplementation aid child survival? A group of researchers affiliated with CISMAC have conducted the study Efficacy of early neonatal supplementation with vitamin A to reduce mortality in infancy in Haryana, India, which was recently published in the Lancet.

VITAMIN A DEFICIENCY IS A PUBLIC HEALTH PROBLEM

Vitamin A is an essential nutrient that is provided in the diet when children have access to adequate foods. Vitamin A supplementation of children older than 6 months reduces child mortality in countries where vitamin A deficiency is a problem. In many countries, mostly in Africa and Southeast Asia, vitamin A deficiency is a public health problem affecting pregnant women and children aged 3–5 years.

The national programme in India recommends that children receive doses of vitamin A every 6 months starting at 9 months of age, but a national survey showed that only 16 % of children aged 12–35 months had received vitamin A in the previous 6 months. Preventing vitamin A deficiency in young children is a priority.

THE STUDY SITE IN HARYANA

The study was conducted in Haryana, India, between June 2010 and July 2012. About half of the families in the study area are nuclear (a family group consisting of a pair of adults and their children), the median family size is six, half of the mothers of young children have never been to school, and most women do not work outside the home.

All women of reproductive age who were residents of the study area were included in continuing pregnancy surveillance. Study workers followed up pregnancies until delivery and reported new births to the coordinators within 12 hours, who in turn informed enrolment workers immediately. Newborns were supplemented with vitamin A in the first 72 hours of life.



STUDY FINDINGS

During the study period the researchers screened almost 50,000 newborns and randomly assigned half of them to receive vitamin A, the other half to receive placebo. Between supplementation and 6 months of age, 656 infants died in the vitamin A group and 726 in the placebo group. Although not statistically significant, these findings were consistent with vitamin A supplementation having resulted in a 10% relative reduction in mortality risk. Supplementation was safe and well accepted.

SIMILAR TRIALS IN GHANA AND TANZANIA

This Indian study is a part of a larger group of clinical trials which also includes large, randomized control trials in Ghana and Tanzania: Efficacy of Newborn Vitamin A Supplementation Versus Placebo in Improv-

ing Child Survival ([NeoVitA Trial](#)). The findings from these studies, when viewed together, will enable the determination of an appropriate public health policy on whether or not neonatal vitamin A supplementation should be recommended.

Read the full article here:

[Efficacy of early neonatal supplementation with vitamin A to reduce mortality in infancy in Haryana, India \(Neovita\): a randomised, double-blind, placebo-controlled trial.](#)

Mazumder S, Taneja S, Bhatia K, Yoshida S, Kaur J, Dube B, Toteja GS, Bahl R, Fontaine O, Martines J, Bhandari N; for the Neovita India Study Group. Lancet. 2014 Dec 10

CAN BREASTFEEDING RUIN THE EFFECT OF VACCINES FOR THE BABY?

In a recent study published in the journal Vaccine, CISMAC researchers examine whether breastfeeding can hamper the immune response to an oral live rotavirus vaccine.

ROTAVIRUS – AN IMPORTANT CAUSE OF CHILDHOOD DIARRHEA AND DEATH

Rotavirus infects almost all kids and is one of the most common causes of fatal and severe diarrhea. In India, the virus is responsible for almost 100,000 deaths each year. The World Health Organization (WHO) has recommended inclusion of rotavirus vaccines in all national immunization programs.

The vaccines Rotarix® and RotaTeq® have both demonstrated high efficacy (>90%) in high- and middle-income countries. Trials conducted in developing settings in Africa and Asia showed considerably lower efficacy (about 50–60%), but when rolled out in country programs seem to substantially reduce the diarrhea disease burden. A new Indian vaccine Rotavac® performed similarly to the much more expensive Rotarix® and RotaTeq® vaccines. Other live oral vaccines have also performed relatively poorly in low and middle income countries compared to in more affluent countries.

BETTER EFFECT OF THE VACCINES IN AFFLUENT COUNTRIES

Possible reasons for the somewhat lower efficacy of vaccines in developing settings include malnutrition, interference from maternal antibodies in breast milk and other intestinal infections. Indian women seem to have higher concentrations of rotavirus neutralizing antibodies in breast milk than women in industrialized countries. Studies of the neutralizing effect of breast milk have suggested that withholding breastfeeding around the time when the rotavirus vaccine is given, could improve the immune response to the vaccine.

Without clear evidence, it is difficult to determine whether rotavirus antibodies in breast milk interfere with immune responses to oral rotavirus vaccines in infants. It is important to explore this connection, as it may help improve the impact of the vaccines. In the study presented in Vaccine the research team measured whether withholding breastfeeding around the time of vaccination would improve its ability to trigger an immune response.

NEW DELHI STUDY: 400 MOTHERS WITH THEIR BABIES

This study enrolled 400 six weeks old infants who were vaccinated with Rotarix®. The mothers of 200 of these infants were asked to withhold breastfeeding during a one hour period around the time of vaccination, while the remaining half of the mothers were encouraged to breastfeed their babies.

Blood and breast milk specimens were collected from the mothers at the start of the study, and breast milk specimens were also obtained at the time of the second vaccine dose.

WITHHOLDING BREASTFEEDING DID NOT IMPROVE THE VACCINE EFFECT

In this population, the immune response to the Rotarix® vaccine was not improved by withholding breastfeeding around the time of vaccination. Maternal anti-rotavirus antibodies explained little of the variability in the immune response to the vaccine.

The researchers concluded that factors other than maternal anti-rotavirus antibodies probably explain why babies in low-and middle-income settings respond poorly to live oral rotavirus vaccines.

Read the full article here:

[**Effect of withholding breastfeeding on the immune response to a live oral rotavirus vaccine in North Indian infants.**](#)

Rongsen-Chandola T, Strand TA, Goyal N, Flem E, Rathore SS, Arya A, Winje BA, Lazarus R, Shanmugasundaram E, Babji S, Sommerfelt H, Vainio K, Kang G, Bhandari N.
Vaccine. 2014 Aug



FORMATIVE RESEARCH TO PLAN COMPLEX INTERVENTIONS

Formative research is vital in the planning of complex health interventions that aim to change social practices of a target population (health workers, at risk populations, patients, care-takers etc). Such interventions commonly involve complex socio-behavioural processes that are highly context specific. An intervention that is effective in one setting may not be feasible or acceptable in another, or it may need adaptation and tailoring to the social, cultural or political context in question. To prepare an intervention that is sensitive to the political, social and cultural environment requires a comprehensive formative phase in which barriers and facilitators of the planned intervention are explored. This allows for modification of initial assumptions and planned objectives, strategies and messages. The purpose of the formative phase of an intervention study is thus to generate knowledge to enhance the relevance and the socio-cultural appropriateness of the planned intervention. This involves an exploration of political priorities, power structures, practices, values and norms that maintain or challenge the particular problem that the intervention aims to address. It presupposes involvement of stakeholders at different levels in the planning of the intervention.

Formative research may include both qualitative and quantitative approaches, but qualitative research designs that are rooted in an explorative and inductive research tradition are particularly suitable in studying issues related to culture and social relations in general, and the appropriateness of behaviour change interventions and local contexts in particular. Although an ethnographic approach is desirable, it is commonly too time-consuming and more rapid assessments are possible using a combination of participatory approaches, observations and various kinds of interviews with stakeholders on individual and group levels.

In CISMAC, formative research is built into the design of studies that involve changing established practices of individuals in health care institutions and/or community settings in order to improve health outcomes for the target group. In 2014–15 two CISMAC Studies; Girl empowerment to reduce risk of early pregnancy in Zambia and Impact of Kangaroo Mother Care (KMC) with support for low birth weight infants in India have conducted formative research.

FORMATIVE RESEARCH IN PREPARATION FOR THE STUDY ON ADOLESCENT GIRLS IN ZAMBIA

CISMAC is planning a trial in Zambia that aims to measure the effectiveness and cost-effectiveness of two intervention packages on adolescent childbearing, early marriage, secondary school enrolment and school attendance. In preparing this trial we first conducted a stakeholder meeting with representation from policy-making bodies at the Zambian national and regional levels to explore political priorities related to schooling and reproductive health. We used the 'PRECEDE – PROCEED' model¹ as a starting point when we developed the formative research design, but focused only on the PRECEDE part which defines five steps of situation analysis. This includes 1) social assessment, 2) epidemiological assessment, 3) behavioural/environmental assessment, 4) educational/ecological assessment, and 5) administrative/policy analysis.



¹ Crosby R. and Noar SM 2011 What is a planning model? An introduction to PRECEDE-PROCEED. Journal of Public Health Dentistry 71, 2011:7-15

Thus, we did a broad mapping of values and norms related to early pregnancy, early marriage and school dropout of adolescent girls in three of the communities selected for the future trial.

Twenty four in-depth interviews and six focus group discussions were conducted with girls, teachers, health workers, community leaders, parents and boys. The findings revealed that the main explanations provided for school drop-out, early pregnancy and early marriage were overlapping and interlinked. Poverty was brought up as a reason for all three; many families cannot afford to buy school uniforms or pay fees at secondary school level as the following quotes illustrate:

“They fail to support their children at school level. A child will just sit back. You follow up and parents have no money and when parents have no money, what do they do? They just marry them off. Sometimes it’s not their fault – it’s just the poverty”.

Guidance and counselling teacher

But parents may also put pressure on their daughters to get sexual partners or even to become pregnant to obtain the bride price and economic support for their daughters:

“The other thing that makes girls to be married early is poverty. Poverty! When they see that the girl’s breasts have become sharp, they send them to good households to play, even if she gets pregnant they know they will get some wealth. … They still marry the child off even when she is not ready to be married. … Adults also pressurize the children to get married even when the child wants to go to school.” *Female chief*

Girls mentioned a desire for gifts such as lotion or soap or for money as a reason for having sex with a boyfriend. Pregnancy was described as leading to school drop-out and marriage, although some girls were reported to re-enter school after having given birth. Several informants mentioned that many parents did not encourage their daughter to continue with school because they did not see the benefit of it, and instead encouraged them to get married.

“Let the parents understand the importance of education and also they should value education because the way it is now they feel the only way they can get money is through marrying off the girl child. But if they are educated and enlightened on the importance of the girls to be in school, I am sure that would be mitigated.”

District Maternal Child Health Coordinator

Lack of accurate knowledge about when the fertile period is in the menstrual cycle and social barriers to seeking contraceptives were mentioned as factors that lead to girls getting pregnant. Girls were regarded by many as ready for marriage after menarche, and pregnancy among girls who have dropped out of school was regarded as culturally acceptable.

Informed by the first phase of our formative research, we have designed a package that targets what we have identified as the main causes of early pregnancy: (1) An economic component targeting the poverty dimension and the school drop-out dimension; and (2) A community component that targets knowledge and social acceptability/norms regarding contraceptive use and the empowerment of girls. The second phase of formative research has just been completed. The purpose was to explore the appropriateness of the intervention package among key stakeholders at community, school, health care and administrative level, and to further refine the intervention package. We plan to pilot the intervention later in 2015 and start the trial itself in early 2016.

FORMATIVE RESEARCH IN PREPARATION FOR THE COMMUNITY-BASED KANGAROO MOTHER CARE STUDY IN INDIA

Sarmila Mazumder is the principal investigator for the formative research in preparation for CISMAC’s study on the effectiveness of community-based Kangaroo Mother Care for low birth weight babies. In this interview she describes to us the ongoing research in India.



Q: What will you examine in the Randomized Control trial (RCT) about community based Kangaroo Mother Care (KMC)?

A: We will examine the impact of KMC on neonatal mortality and mortality from birth to 6 months of age. We will also look at weight and length gain, breastfeeding practices and infant infections.

Q: How will the formative research you are conducting influence the final intervention that will be implemented during the RCT?

A: The formative research will generate information that will help develop a feasible and effective intervention package to promote KMC in the community. We will primarily know whether community-based KMC is feasible to implement in the study setting and if so, will it be acceptable by mothers and families. We will also learn about the most effective way(s) to promote KMC in the proposed study setting.

Q: What has the Study team done so far and what will they do throughout the rest of the formative research phase?

A: We have compiled information from previous studies. Interviews have been conducted with mothers to obtain an in-depth understanding of current practices around birth. We have also conducted a week-long observation in the KMC ward of a tertiary hospital.

We have had meetings with the state and district health authorities and held orientation sessions with the local health center staff and community health workers in the two Primary Health Center (PHC) areas where the formative research will go on.

Based on the findings from the formative research, a prototype intervention will be designed. A small number of household trials will be conducted to refine the intervention package which will be pilot-tested in approximately 40 to 50 mother-infant pairs.

Q: Based on your impressions from the ongoing formative research, which are the challenges you think you will encounter during the implementation of the intervention?

A: The intervention requires a lot of support for the mothers, both physical and emotional, from the other family members. Whereas this is not a problem in the rural areas with joint families (head of family and spouse with their married children living together) where adequate privacy for the mother and newborn is available, this may pose a challenge in the semi-urban areas where the family members stay in a single room accommodation.

We have found that many mothers consider the summer to be an obstacle to the practice of KMC due to sweat and the sticky feeling of the skin-to-skin contact. The sweat can also cause peeling off of the baby's skin which is delicate. Many mothers are also concerned that diseases and infections from mothers will be transferred to the baby through the sweat.

Also cultural barriers that prevent women from wearing open front garments which are necessary for practicing KMC will create challenges. Mothers also expressed fear that the ribs of the baby will be compressed during KMC or that the baby's abdomen will be squeezed if a binder is used to hold the baby in a KMC position.

All the anticipated difficulties and apprehensions reported by the mothers and families will be addressed in the counseling guides that will be used during the main trial. During in-depth interviews and focus group discussions, we explored whether these issues can be resolved. It was clear that the community is open to advice, receptive and willing to change current practices if it is explained to them that these may be harmful for the newborns and that new practices can bring significant benefits.



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BY USING AN EQUITY LENS,
WE CAN MEASURE BOTH THE
HEALTH AND EQUITY IMPACT
OF INTERVENTIONS

USING AN EQUITY LENS IN INTERVENTION RESEARCH

CISMAC's vision is to support improvement of maternal, neonatal and child health (MNCH) in low and middle income countries in Africa and Asia. Through evaluating new and existing interventions and interacting with key stakeholders CISMAC aims to inform health policy and programs. In order to achieve this, it is crucial that the interventions are evaluated from a holistic perspective taking all relevant aspects into account. Mapping the sociocultural context in which an intervention is implemented is essential to future upscaling and inclusion in health programs. Evaluation of cost-effectiveness and economic impact taking into account the equity dimension is also important for informing health policy. Mickey Chopra, Head Health and Assistance Director in UNICEF emphasizes equity when he describes the role CISMAC can play in improving maternal, neonatal and child health.

In this interview, CISMAC researcher Professor Ole Frithjof Norheim elaborates on how CISMAC works towards integrating the equity perspective on its studies:

Q: Why is equity so important?

A: Maternal and child mortality and ill health disproportionately affect the world's poor, not only when we compare countries, but also within each country. In all of the projects we therefore want to generate evidence to effectively and equitably improve maternal and child health. We do this by employing an equity lens in our studies.



Q: How do you employ an equity lens?

A: In the studies where this is appropriate we design our data collection tools to also include information about poverty. We can then compare baseline data before the intervention to results in the different arms of the trial after the intervention. We know that the risk of ill health is more concentrated among the poor, and we explore whether the interventions themselves will increase or decrease this inequity. If the interventions reduce inequities in outcomes, then we have succeeded in equitably improving maternal and child health. If not, that would be very important to know. Evidence on equity impact is increasingly becoming important in policy formulation and implementation.

Q: But equity is not only about health outcomes?

A: That is correct. Ill health and paying out of pocket for treatment can also push families into poverty. We therefore measure the costs of interventions and to what extent implementing effective interventions provide financial risk protection.

In our research we build on earlier modeling studies by UNICEF that suggest there is not, as is often believed, a trade-off between equity and efficiency. Investing in MNCH interventions will improve both equity and efficiency. By putting all our information together, we hope to document through our research which maternal and child health interventions actually improve efficiency, reduce inequity in health, and provide financial risk protection. By using an equity lens, we can measure both the health and equity impact of interventions.

PEOPLE 2014

STUDY	DELAYED BCG VACCINATION IN HIV-EXPOSED UNINFECTED INFANTS IN UGANDA
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Halvor Sommerfelt	University of Bergen
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James Tumwine	Makerere University
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STUDY	EDUCATION AND OTHER APPROACHES TO EMPOWER ADOLESCENT GIRLS TO REDUCE TEENAGE CHILDBEARING IN ZAMBIA
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STUDY	IMPACT OF KANGAROO MOTHER CARE (KMC) WITH SUPPORT FOR LOW BIRTH WEIGHT INFANTS IN INDIA
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Nita Bhandari	Society for Applied Studies
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Rajiv Bahl	WHO

STUDY	INCREASING COVERAGE OF POSTNATAL CARE ON THE FIRST DAY AFTER BIRTH BY IMPROVING HEALTH SYSTEMS PERFORMANCE IN INDIA
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STUDY	SUPPLEMENTATION WITH HIGH DOSES OF VITAMIN B12 IN PREGNANCY TO IMPROVE COGNITIVE FUNCTIONING IN EARLY CHILDHOOD IN NEPAL
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STUDY	ZINC AS AN ADJUNCT FOR THE TREATMENT OF VERY SEVERE DISEASE IN YOUNG INFANTS IN INDIA AND NEPAL
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PUBLICATIONS 2014

Mazumder S, Taneja S, Bhatia K, Yoshida S, Kaur J, Dube B, Toteja GS, Bahl R, Fontaine O, Martines J, Bhandari N; for the Neovita India Study Group. *Efficacy of early neonatal supplementation with vitamin A to reduce mortality in infancy in Haryana, India (Neovita): a randomised, double-blind, placebo-controlled trial.* Lancet. 2014 Dec 10

Mazumder S, Taneja S, Bahl R, Mohan P, Strand TA, Sommerfelt H, Kirkwood BR, Goyal N, Van Den Hombergh H, Martines J, Bhandari N; on behalf of the Integrated Management of Neonatal and Childhood Illness Evaluation Study Group. *Effect of implementation of Integrated Management of Neonatal and Childhood Illness programme on treatment seeking practices for morbidities in infants: cluster randomised trial* BMJ. 2014 Aug

Rongsen-Chandola T, **Strand TA, Goyal N, Flem E, Rathore SS, Arya A, Winje BA, Lazarus R, Shanmugasundaram E, Babji S, Sommerfelt H, Vainio K, Kang G, Bhandari N.** *Effect of withholding breastfeeding on the immune response to a live oral rotavirus vaccine in North Indian infants* Vaccine. 2014 Aug

Yoshida S, Rudan I, Lawn JE, Wall S, Souza JP, **Martines J, Bahl R;** neonatal health research priority setting group. *Newborn health research priorities beyond 2015.* Lancet. 2014 Jul 12

Darmstadt GL, Kinney MV, Chopra M, Cousens S, Kak L, Paul VK, **Martines J, Bhutta ZA, Lawn JE;** Lancet Every Newborn Study Group. *Who has been caring for the baby?* Lancet. 2014 Jul 12

CISMAC members in bold



TOWARDS A BRIGHTER FUTURE FOR MOTHERS AND CHILDREN



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

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

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