



# RANCHI LOW BIRTH WEIGHT PROJECT

Reducing Incidence of  
Low Birth Weight using a  
Community based Life Cycle Strategy



## Study Protocol

Krishi Gram Vikas Kendra  
Child In Need Institute  
Social Initiatives Group, ICICI Bank

## Ranchi Low Birth Weight Project Study Protocol, October 2006

### The Project Partners

Krishi Gram Vikas Kendra (KGVK), a Ranchi based non governmental organization (NGO), has been working closely with local communities in Jharkhand for more than three decades. The organisation has undertaken initiatives in the areas of health, watershed development, education and livelihoods. It has been recognized as a Mother NGO in the state of Jharkhand under the Reproductive and Child Health Programme, Ministry of Health and Family Welfare, Government of India.

Child In Need Institute (CINI) is guided by its mission of ‘Sustainable Development in Health, Nutrition and Education for child, adolescent and woman in need.’ A national NGO with presence in multiple states, it has been recognized as a Regional Resource Centre under the Reproductive and Child Health Programme, Ministry of Health and Family Welfare, Government of India. CINI has evolved a life cycle based framework for improving key reproductive and child health outcomes through proactive partnerships with government and non government stakeholders.

Social Initiatives Group (SIG), ICICI Bank, supports innovative initiatives in the areas of early child health, elementary education and micro financial services with an aim to improving human capacity. In partnership with governments, NGOs, academic and research institutions, SIG co-develops and funds the development of evidence based models addressing key sectoral gaps in knowledge and practice that have the potential to be mainstreamed through larger systems.

The Department of Health, Medical Education and Family Welfare and the Department of Social Welfare, Government of Jharkhand are closely involved in the project. They have played an important role in problem identification, project design and in the intervention process as well.

Technical assistance for the research aspects has been received from Dr. Michael McQuestion, formerly at the Johns Hopkins Bloomberg School of Public Health, Baltimore, USA, and Dr. Michele Dreyfuss of the same institute.

## List of Abbreviations

ANC	Antenatal Care
ANM	Auxiliary Nurse cum Midwife
AWC	Anganwadi Centre
AWW	Anganwadi Worker
CHW	Community Health Worker
CINI	Child In Need Institute
CHC	Community Health Centre
GoJ	Government of Jharkhand
HH	Household
ICDS	Integrated Child Development Services
IMR	Infant Mortality Rate
KGVK	Krishi Gram Vikas Kendra
LBW	Low Birth Weight
LCA	Life Cycle Approach
MO	Medical Officer
NRHM	National Rural Health Mission
NGO	Non Governmental Organisation
PHC	Primary Health Centre
SIG	Social Initiatives Group
SC	Sub Centre
TBA	Traditional Birth Attendant
VHC	Village Health Committee

# Introduction to Ranchi LBW Project

The Ranchi Low Birth Weight Project is a quasi-experimental action research study to evaluate the effectiveness of life-cycle based community level behavioural interventions in reducing the incidence of low birth weight and improving maternal and child health in Ranchi district of Jharkhand state in India.

## Aims

Low birth weight (LBW) and childhood malnutrition continue to be major public health problems in India. It is well recognised that maternal and child health services as well as a range of behavioural factors need to work synergistically to break the intergenerational cycle of malnutrition and improve these key indicators which determine long term prosperity and productivity of a nation. Based on the partners' and other experiences in India and elsewhere, interventions in the Ranchi LBW project aim to improve maternal and infant health outcomes by addressing a range of medico-social and behavioural determinants of low birth weight. The study envisages implementing and evaluating the additive effects of community level behavioural interventions in bringing about positive improvements in maternal and infant health outcomes in an area where mandated public health and related services are ensured.

## Key Interventions

Two complementary sets of interventions are used in the project: (1) community level behavioural interventions and, (2) interventions to ensure provision of mandated public health services, randomly allocated between sub centre areas in Angara and Silli blocks in Ranchi district. Fifty percent randomly selected sub centre areas in Sonahatu and Mandar blocks in the same district serve as the comparison area with no intervention.

The community based interventions include a hamlet level community health worker (*Sabiyya*) and Village Health Committee who act as agents of community mobilisation by undertaking behaviour change communication, preventive and promotive case management in the area of maternal and infant health and facilitating linking of communities with health services. At the service delivery level, the focus is on bridging existing gaps in mandated public health care delivery by ensuring regular supplies of essential drugs, provider capacity building and renovation or construction of sub centre facilities.

## Outcomes

The primary outcome measure of the study is the proportion of low birth weight. The other critical outcome measures include infant mortality rate, childhood malnutrition, maternal and neonatal care practices, dietary habits of adolescent girls and pregnant women and infant feeding practices. The study critically examines the processes through which change in such practices occur in the community and the role of community agents and health systems in bringing about this change.

## Background

### Why focus on Low Birth Weight?

Low birth weight (LBW)\* and childhood malnutrition continue to be major public health problems in India. Out of 26 million infants born in India each year, 7.8 million are born with low birth weight, accounting for about 40 percent of the global burden<sup>1</sup>. LBW contributes to neonatal and childhood morbidity and mortality, impedes growth and development during childhood, and has been linked to adult disease like diabetes and coronary heart disease<sup>2 3 4</sup>. Reduction of LBW is therefore critical to improving infant and child morbidity and mortality, as well as raising productivity and lifetime private earnings, and also reducing private and public health care expenditures throughout the lifecycle<sup>5</sup>.

### Low Birth Weight, Malnutrition and the Lifecycle Approach

The prevalence of low birth weight and malnutrition is representative of not just poor survival and quality of life risks for children but essentially mirrors the poor nutritional and health status of women and young girls across their life cycles, especially in the context of a developing country like India. The causal pathways, therefore, capture a range of interrelated determinants that operate at multiple levels – individual, household, community and systems.

Major determinants of low birth weight are poor maternal nutritional status at conception, low gestational weight gain due to inadequate dietary intake, and short maternal stature due to the mother's own childhood under nutrition. Here a vicious cycle of low birth weight and malnutrition is created which is perpetuated across generations. Low birth weight thus becomes a significant cause and a consequence of under nutrition. Clearly, to break this intergenerational cycle of low birth weight and malnutrition, interventions at critical stages of the lifecycle<sup>6 7 8</sup> to address risks and opportunities during pregnancy and moving through birth, infancy, early childhood and adolescence are needed.



\* Birth weight less than 2500 grams

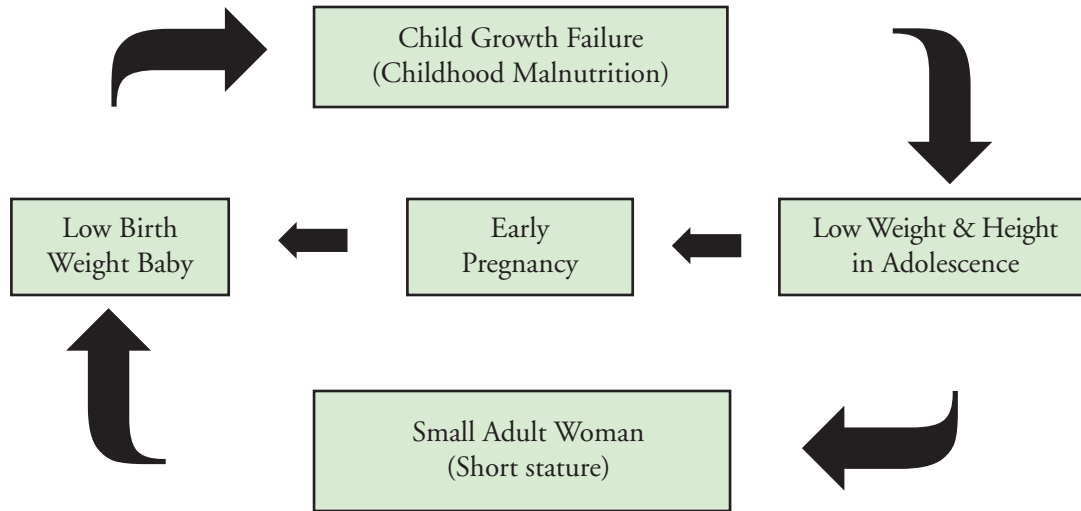


Figure 1. Intergenerational Cycle of Low Birth Weight and Malnutrition<sup>9</sup>

## Maternal and Child Health situation in Jharkhand

Jharkhand in eastern India is predominantly a rural state with a total population of 26.9 million of which about 28 percent is tribal<sup>10</sup>. The Infant Mortality Rate (IMR) is 71 per 1000 live births. Nearly 90 percent of the deliveries take place at home and only ten percent of the pregnant women receive at least one antenatal check up. Less than ten percent of children aged between 12 and 23 months are fully immunised, with around one-third receiving no immunisation at all. Diarrhoea and acute respiratory infections are common and nearly 80 percent of children in the state suffer from some form of anaemia, of which 56 percent are moderately to severely anaemic. Moreover, about 49 percent of the girls marry before they reach the legal age of marriage (18 years)<sup>11</sup>. Acute shortage of healthcare facilities in the state with around 38 percent in the case of Sub Centres (SC), 64 percent for Primary Health Centres (PHC) and 82 percent for Community Health Centres (CHC) adds to the problem<sup>12</sup>. The utilisation of existing public health facilities is low as they are largely inaccessible to many populations settled in remote and difficult to access areas scattered across the hilly landscape of the state.



Figure 2. Jharkhand state in India

# Research Design

## Research Objective

The Ranchi Low Birth Weight Project seeks to evaluate the effectiveness of lifecycle-based community level behavioural interventions in reducing the incidence of low birth weight and improving maternal and infant health in selected four blocks in Ranchi district of Jharkhand state in India.

## Research Hypotheses

The primary research hypothesis guiding the project is:

- The proportion of LBW infants in areas with community level intervention along with mandated primary health care delivery system (t2 areas) will be significantly lower than that in areas with mandated primary health care facilities alone without community level interventions (t1 areas) at the end of the project period.

Additional hypotheses are:

- Maternal and child health outcomes will be significantly better in t2 areas than those in t1 areas alone.
- Antenatal and child health care service utilisation in t2 areas will be significantly greater than those in t1 areas.

## Study Design

The project uses a three-area quasi-experimental pre-test, post-test evaluation design to test the above hypotheses (Figure 3). The three-area design will allow evaluation of the additive effects of the community mobilisation intervention in addition to the effect of provision of all mandated public health services on low birth weight and other related outcomes. The design also recognizes that the community mobilisation treatment effect is theoretically inseparable from that of the interventions aimed at ensuring mandated primary healthcare services. At baseline, population-based multiple-level surveys have been carried out measuring low birth weight, maternal and child health status and various contextual indicators, as well as mandated health service provision at village and sub centre level. Key informant interviews were held with Auxiliary Nurse cum Midwives (ANM), *Anganwadi* Worker (AWW) and Traditional Birth Attendants (TBA). End line surveys will be carried out in the same population at the end of the intervention period. Data is collected only from consenting individuals.

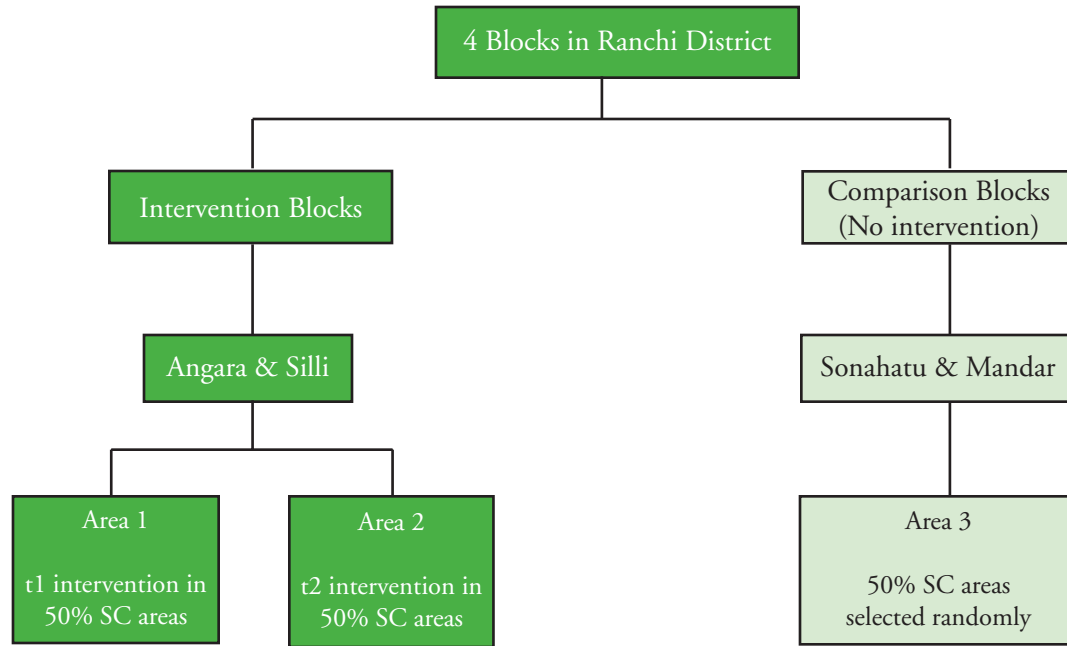


Figure 3. The Study Design

t1= Ensuring Mandated Health Services  
t2 = Community Mobilisation plus ensuring Mandated Health Services

## Sampling Design

A multistage systematic random sampling design is used to conduct all household level surveys. The village survey was conducted in 195 villages. For all respondent categories apart from the antenatal cohort category, only one eligible respondent is chosen for being interviewed from each selected household (Figure 4).

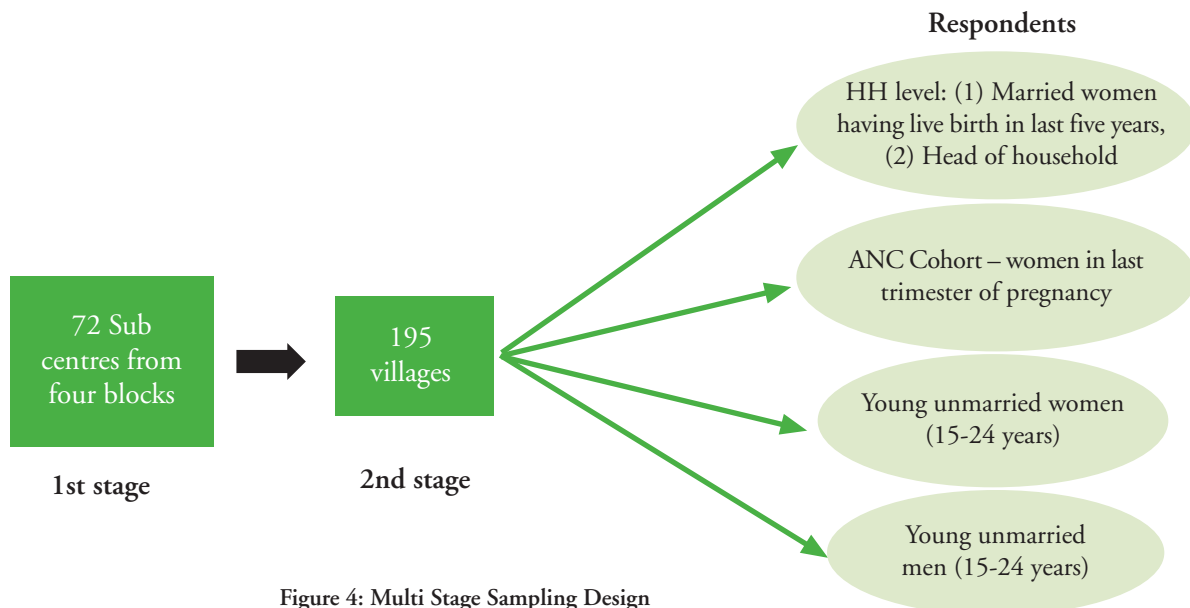


Figure 4: Multi Stage Sampling Design



## Data Collection Instruments

### Married Woman Questionnaire

Collects information from 15-49 year married women with a live birth in the last five years on key demographic variables, knowledge, attitude and practices regarding pregnancy and other maternal and child health variables.

### ANC Questionnaire

Follows and collects information from third trimester pregnant women till their delivery. Measures haemoglobin level, assesses dietary practice, workload and rest during pregnancy and birth weight of infants born to them.

### Village Schedule

Key informant interviews of community leaders. Collects information on community-level contextual variables affecting birth weight and maternal and child health outcomes and suggestions about collective action interventions.

### Youth Questionnaire

Collects information from 15-24 years unmarried young people (male and female) on awareness and practice related to reproductive health and nutrition issues, measures haemoglobin of unmarried young females.

### ANM and AWW Questionnaire

Collects information from ANMs and AWWs on knowledge and practices on maternal and child health issues. Additionally, information on subcentre level facilities and services is collected from ANMs.

### TBA Questionnaire

Collects information from TBAs on knowledge, awareness and practices regarding antenatal care, delivery and postnatal care.

## Key Interventions Components

### The Approach

The two intervention sets, viz. (1) community level behavioural interventions and (2) interventions to ensure provision of mandated public health services follow the lifecycle framework (Figure 5).

A series of discussions and dialogues between project partners and stakeholders at village, sub centre and referral level helped to finetune components of both the interventions.

Interventions at critical stage	Contribute to
Interventions during pregnancy and delivery	<ul style="list-style-type: none"> <li>• Prevention of maternal morbidity and mortality.</li> <li>• Improvement in intrauterine growth.</li> <li>• Reduction of pre-term births.</li> <li>• Reduction of perinatal morbidity and mortality.</li> </ul>
Interventions during the first two years of life	<ul style="list-style-type: none"> <li>• Reduction of neonatal morbidity and mortality.</li> <li>• Improvement in growth and development of child.</li> <li>• Reduction of childhood malnutrition.</li> <li>• Reduction of infant mortality.</li> </ul>
Interventions during adolescence and pre-pregnancy period	<ul style="list-style-type: none"> <li>• Improvement in pre-pregnancy nutritional status for girls.</li> <li>• Awareness and positive health and nutrition related behaviour among adolescent girls and boys.</li> <li>• Delay in pregnancy and childbearing among adolescent girls.</li> </ul>

Figure 5 : Key Benefits of the Life Cycle Approach

## Involvement of Government and Civil Society Stakeholders

A **Project Steering Committee** under the chairmanship of Secretary, Department of Health, Medical Education and Family Welfare, Government of Jharkhand, with members from the department and civil society has been formed to guide the project. This committee has been instrumental in deciding broad directions of the project and meets three to four times in a year to review progress, decide which elements from the project interventions could be replicated in the health system and chart out future plans.

A **Project Implementation Committee** has been formed to guide and support the interventions at the implementation level. The State Reproductive and Child Health Officer, Government of Jharkhand, heads this committee and it includes members from health and social welfare departments of the state.

## Intervention Components

- (1) **Community level behavioural interventions** aim at inducing collective action on health issues by individuals, families and communities on health, hygiene and nutrition, including maternal and child health issues. This set of intervention is spearheaded by a hamlet level female community health worker (*Sahiyya*). She is selected and supported by Village Health Committees (VHCs), and together, they act as agents of community mobilisation. They help build ownership and also initiate action on community health issues.

The VHCs act as village based social mobilisation networks comprising of community members. They facilitate access to and delivery of effective healthcare for all residents of the community. The VHCs are selected in a *Gram Sabha* meeting after a process of orientation and engagement on the community's health problems and needs has been undertaken by the field supervisors of the project. The VHCs are thus active fora for collective action aimed at improving the general health of the village. This includes monitoring and facilitating improvement in health service delivery and also the initiation and management of health funds. The VHCs also support formation of hamlet level adolescent peer groups, which spread awareness about health and social issues among young people, and in their communities.

The *Sahiyya* is a voluntary female health worker selected from the community. Her role is to create awareness regarding health and its social determinants and also to mobilise the community to access and utilise health services. Supported by the VHCs, the *Sahiyya* builds awareness on health and nutrition issues in her hamlet, identifies each pregnant woman in her first trimester of pregnancy and monitors her progress through her pregnancy and delivery till her child reaches two years of age. Playing primarily a preventive and promotive role, she focuses on changing dietary practices and reducing workload during pregnancy, availing antenatal care from health facilities, delivery by a trained TBA, early detection of possible complications related to pregnancy or delivery and referral of such cases. She also encourages adoption of exclusive breastfeeding and age appropriate infant feeding and caring practices. The *Sahiyya* is suitably equipped to perform her role through trainings and continuous support from project functionaries.

- (2) **Interventions to ensure provision of mandated public health services** were identified to be essential to evaluate additive effects of community level behavioural interventions. Responding to community demands through supply of appropriate services is a necessary condition for attainment of positive health outcomes and overall household health production.

The focus is on bridging existing gaps in mandated public health care delivery by ensuring regular supplies of essential drugs and necessary equipments, provider capacity building, renovation or construction of sub centre facilities where these are required, ensuring availability of emergency obstetric care through equipped health facilities, and ensuring the provision of medical services in remote and inaccessible areas through mobile medical vans with basic diagnostic facilities. The aspect of provider capacity building includes orienting and training of public health functionaries including MOs, ANMs and AWWs to enhance their community perspective of health and also facilitating linkages between the communities and the systems. Introduction of continuous review meeting with *Sabhiyya*, ANM, AWW and VHCs is also an integral activity that helps in identifying and encouraging good practices and overcoming bottlenecks in achieving desired health outcomes.

## Outcomes

The primary outcome measure of the study is the proportion of low birth weight. The other critical outcome measures include infant mortality rate, childhood malnutrition prevalence, maternal and neonatal care practices, dietary habits of adolescent girls and pregnant women and infant feeding practices. The study critically examines the processes through which change in such practices occur in the community and the role of community agents and health systems in bringing about this change. It also documents and analyses processes of capacity building and engagement of the *Sabhiyyas* and VHCs with the system, thereby contributing to the goals and priorities of the National Rural Health Mission (NRHM). Since its inception, the project has been able to contribute to informing state policies and programmes in the area of maternal and child health.



## Ethical Considerations

### Community and Stakeholder participation

At every stage of design and implementation, community members including village leaders, representatives of women's groups, government health and social welfare department functionaries and local community based organisation members are being consulted. The results of the baseline have been shared with various stakeholders through formal and informal meetings.

### Referral for illness for study participants

All respondents during baseline and endline who display severe anaemia and other complaints would be advised and referred by the interviewers to the PHC for treatment. During the intervention period, the *Sahiyya* works closely with the ANM and refers patients to the sub centre or the PHC.

### Confidentiality of Information

All information collected during baseline and endline surveys will remain confidential and access to such information will be limited to the Project Research Team at CINI. All analyses and subsequent reports or manuscripts will not have names of study participants mentioned anywhere. An Ethical Clearance had been obtained from the CINI Institutional Review Committee. All the information is collected from consenting subjects.



## References

1. United Nations Children's Fund and World Health Organization. *Low Birthweight: Country, regional and global estimates*. UNICEF, New York, 2004.
2. UNICEF ROSA. *Malnutrition in South Asia: A Regional Profile*. Regional Office for South Asia (ROSA). UNICEF. 1997.
3. Yasmin, Osrin. *et al.* "Neonatal mortality of low-birth-weight infants in Bangladesh." *Bulletin of the World Health Organization* 79(7): 608-614, 2001.
4. Barker. *Mothers, babies and disease in later life*. Churchill Livingstone, Edinburgh, 1998.
5. Gillespie, Haddad. *Attacking the Double Burden of Malnutrition in Asia*. Sage Publications, 2003.
6. Sachdev. Low Birth Weight in South Asia. In *Malnutrition in South Asia: A Regional Profile*. Regional Office for South Asia (ROSA). UNICEF. 1997.
7. Ramaligaswami, Jonsson, Rohde. Malnutrition: A South Asian Enigma. In *Malnutrition in South Asia: A Regional Profile*. Regional Office for South Asia (ROSA). UNICEF. 1997.
8. Gillespie. *Improving Adolescent and Maternal Nutrition: An overview of Benefits and Options*. UNICEF Staff Working Papers. Nutrition Series. Number 97-002. New York. UNICEF. 1997.
9. ACC/SCN. *What Works? A Review of the Efficacy and Effectiveness of Nutrition Interventions*; Allen. Gillespie. SR. ACC/SCN : Geneva in collaboration with Asian Development Bank, Manila, 2001.
10. Registrar General of India, *Census of India 2001*.
11. International Institute for Population Sciences & ORC Macro, NFHS-II (1998-1999), India, IIPS; 2002.
12. Report, Ministry of Health, Medical Education and Family Welfare, Government of Jharkhand, 2003 & 2004.

## Acknowledgements

Written by:

Ms. Anuska Kalita and Ms. Ronita Chattopadhyay

Editorial inputs by:

Ms. Laboni Jana and Dr. Subroto K. Mondal

The project would like to acknowledge Col. S. K. Rath, Mr. Shibaji Mandal, Dr. V. P. Pandey, Dr. S. K. Mitra, Ms. Meeta Jaruhar, Ms. Tushara Shankar, Ms. Sumona Ganguli, Ms. Deepmala, Mr. Ajay Kumar, Mr. Manoj Singh, Mr. Santos Das, Mr. Shyam Kumar, Mr. Swapan Karmakar and Dr. V. P. Sharma from Krishi Gram Vikas Kendra; Dr. K. Pappu, Dr. Suranjeen Prasad, Ms. Shivani Kumar, Mr. Kumar Premchand, Ms. Tanvi Mishra, Dr. Manasee Mishra, Mr. Debashis Sinha, Mr. Chandrasekhar Pandey from the Child In Need Institute; Ms. Shilpa Deshpande, Ms. Aneesa Arur, Ms. Sarover Zaidi, Ms. Mekhala Krishnamurthy, Mr. Vikas Jha, Ms. Devanshi Chanchani, Mr. Abhijit Visaria and Mr. Suyash Rai from the Social Initiatives Group, ICICI Bank; Dr. Michele Dreyfuss and Dr. Michael McQuestion from the Johns Hopkins Bloomberg School of Public Health, Baltimore, USA; and the Department of Health, Medical Education and Family Welfare, Government of Jharkhand, who have contributed to different aspects of conceptualisation and implementation in various phases of the project.

## Ranchi Low Birth Weight Project : A Partnership Project of



**Krishi Gram Vikas Kendra**  
c/o Usha Martin  
Tatisilway, Ranchi  
Jharkhand, Pin- 835103  
Ph: 0651-2265837  
Email: [healthcare@ushamartin.co.in](mailto:healthcare@ushamartin.co.in)  
Website: [www.kgvkindia.org](http://www.kgvkindia.org)



**Child In Need Institute**  
Vill : Daulatpur, P.O. Pailan, Via Joka,  
South 24 Parganas,  
West Bengal. Pin-700104  
Ph: 033-24978192/24978206  
Email: [lca@cinindia.org](mailto:lca@cinindia.org), [rch\\_ciniran@sancharnet.in](mailto:rch_ciniran@sancharnet.in)  
Website: [www.cini-india.org](http://www.cini-india.org)



**Social Initiatives Group, ICICI Bank**  
ICICI Bank Towers  
Bandra-Kurla Complex  
Mumbai, Pin-400051  
Ph: 022-26531414  
Email: [sarover.zaidi.ext@icicibank.com](mailto:sarover.zaidi.ext@icicibank.com), [anuska.kalita@icicibank.com](mailto:anuska.kalita@icicibank.com)  
Website: [www.socialinitiatives.org](http://www.socialinitiatives.org)

### In collaboration with

Department of Health, Medical Education and Family Welfare, Government of Jharkhand.  
Department of Social Welfare, Government of Jharkhand.