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Mother and Infant Research Activities (MIRA)

2

 DECADES
OF ACTIVITIES
(1992 - 2012)

www.mira.org.np

We are happy to produce this report on “Two Decades of MIRA Activities”. It gives a brief overview of work done by MIRA to improve maternal and neonatal health in rural Nepal for last two decades through research, training, services and advocacy in collaboration with Nepal Government and UCL, Institute of Child Health London, UK.

I am greatly indebted to all the mothers and the newborns who participated in our study activities. I want to express my sincere gratitude to the University College London, Centre for International Health and Development at the Institute of Child Health, London, UK, World Health Organization, Geneva, United Nations Children Fund, Nepal, United Nations Fund for Population Activities, Nepal, United Mission to Nepal, United States Agency for International Development, Nepal, Saving Newborn Lives, Nepal Family Health Program, CARE Nepal, PLAN Nepal, Nepal Health Research Council, Social Welfare Council, Extended Service Delivery, Pathfinder International, HealthRight International and Department of Health Services, Ministry of Health and Population for their kind support to carry out our program.

My special thanks go to Prof. Anthony Costello and his team from UCL, CIHD, Institute of Child Health, London for their continued full support to all our studies. Last but not the least, my grateful thanks are for all the field and administrative staff of MIRA and particularly to the members of the Executive Board for their hard work and support to the organization to make the activities possible.

Acknowledgement



Prof. Dharma S. Manandhar
President and Executive Director
Mother and Infant Research Activities

Our partnership with MIRA has been a highlight of my academic career. In 1992 Professor Dharma Manandhar and his colleagues set up Mother and Infant Research Activities in order to strengthen their capacity to do research into the common causes of illness and death amongst women and children. The first collaborative studies between MIRA and UCL Institute of Child Health were based in the main maternity hospital (Prasuti Griha) in Kathmandu. We focused on studying common causes of neonatal deaths like birth asphyxia and low birth weight. As our capacity increased, we conducted a trial of health education for mothers both in the hospital and later at home in poor areas of Kathmandu city.

By 1998 we were ready to expand our research interests into rural areas. Since then we have built two long-lasting community based programmes in the hills (Makwanpur) and the terai (Dhanusha). Based on very large population surveillance (our projects cover over 1 million people or 4% of the population of Nepal) and cluster randomised trials, we have evaluated simple and sustainable interventions such as women's groups, training for community health volunteers, nutritional interventions in pregnancy, and strengthening of health facility committees. We have also studied the social determinants of health in rural Nepal, especially among the poorer sections of society.

The partnership between UCL and MIRA has been a two-way process. The capacity of our UK UCL research fellows has been greatly strengthened. We have learnt about the social and cultural aspects of health in Nepal, about contemporary development, how to mobilise communities, and how to set-up simple surveillance systems at low cost. In return we have brought training in scientific design, and assistance with technical and financial aspects of the programme. My colleagues David Osrin, Joanna Morrison and Naomi Saville have contributed greatly during their long attachments with MIRA. It has been a labour of love. We have had many lively discussions and faced many challenging problems. But working with leaders like Dharma Manandhar, Bhim Shrestha, Kirti Tumbahamphe, and their MIRA colleagues, we have joined teams that are creative, dedicated, and bring friendship and fun to our work.

I hope that the work of MIRA and the links with UCL will continue, with a new generation of young researchers taking up the mantle. There are many important questions to address if we want to improve the health and nutrition and quality of life for families in Nepal.

Message



Prof. Anthony Costello

Prof. of International Child Health and
Director of Institute for Global Health

First Executive Committee Members



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Dr. Madan K. Manandhar

List of Acronyms and Abbreviations

AMDA	Asian Medical Doctor's Association
CB-NCP	Community Based Newborn Care Program
CDO	Chief District Officer
CIHD	Centre for International Health and Development
CHD	Child Health Division
DFID	Department for International Development
DHO	District Health Office
ENC	Essential Newborn Care
ESD	Extended Service Delivery
FHD	Family Health Division
FCHVs	Female Community Health Volunteers
HRI	HealthRight International
ICH	Institute of Child Health
LBW	Low Birth Weight
MCH	Maternal and Child Health
MIRA	Mother and Infant Research Activities
NEPAS	Nepal Pediatric Society
NGO	Non-Government Organization
NSMP	Nepal Safer Motherhood Project
PESON	Perinatal Society of Nepal
RCT	Randomized Controlled Trial
SAARC	South Asian Association for Regional Cooperation
SWC	Social Welfare Council
UCL	University College London
UK	United Kingdom
UMN	United Mission to Nepal
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VDC	Village Development Committee
WHO	World Health Organization

The participatory action cycle



**Problem
identification**



**Planning
together**



Implementation



**Participatory
evaluation**



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Executive Summary

Mother and Infant Research Activities (MIRA) is a national, non-government and non-profit organization established in 1992 A.D. by a group of perinatologists from Nepal led by Prof. Dharma S. Manandhar.

Prof. Anthony Costello of University College London (UCL), Centre for International Health and Development, at the Institute of Child Health, London, United Kingdom played a key role in its formation.

Committed to promoting maternal and infant health in Nepal, MIRA has been conducting studies in collaboration with UCL CIHD London and other national and international organizations and has developed appropriate and cost effective interventions to improve maternal, neonatal and infant health. The central office of MIRA is located in Thapathali, Kathmandu, Nepal. Besides its initial work in Kathmandu, MIRA soon extended its activities to other districts. The field office of MIRA was expanded progressively initially to Makwanpur in 1999, Dhanusha in 2002 and Arghakhanchi in 2010.

MIRA runs under the guidance of its seven executive committee members who include committed and experienced health and development professionals. The Central office has nine professionals and support staff. Makwanpur office has 73 core staff and Janakpur office has 83 core staffs including interviewers, data collection supervisors, women's group facilitators, health strengthening support workers, data audit and data entry clerks, division heads, administrative and support staffs. Two technical advisers from UCL CIHD, ICH, London, U.K. have been assisting MIRA in its professional work.

MIRA has completed several studies to identify important causes of perinatal and neonatal health problems in Nepal. The studies completed till date are on perinatal nutrition, birth asphyxia, multiple micronutrient supplementation in pregnant women and its effects on the mothers and the newborn babies. Most of the studies have been randomised controlled trials which are considered the best in evidence based studies. Participatory women's group intervention has been found to reduce neonatal mortality significantly in the community. The results of the studies have been published in various national and international journals including the Lancet. In addition, MIRA has published books and contributed chapters and articles on maternal and infant health issues.

Another noteworthy activity of MIRA has been its active role in the training of various cadres of health personnel from government and non-government health institutions as well as community health volunteers. MIRA provides various trainings on maternal and perinatal and neonatal care for health workers from the government and non-government sector. As a part of its capacity building, it also created opportunities for short training courses and postgraduate studies including M.Sc. and Ph.D., in UK for Nepalese candidates and opportunities for Ph.D. and M.D. for candidates from UCL UK.

MIRA has also helped in bringing out low cost locally made equipments for the care of the newborns in the health facilities. This helped to drastically cut the cost of providing newborn care service in health facilities. These equipments are not only cheap and easy to operate but also easy to maintain.

MIRA works closely with the Ministry of Health and Population, Government of Nepal. Members of MIRA were involved in the formation of National Neonatal Health Policy and Strategy in 2004 A.D., Safe Motherhood and Newborn care policy and plan of the Government of Nepal (GoN) and Community Based Newborn Care Programme. MIRA had played a great role in the establishment of Perinatal Society of Nepal (PESON).

MIRA was a member of a research consortium called 'Towards 4+5' which aimed to improve maternal, neonatal and infant health, with support from Department For International Development, United Kingdom. The focus of the consortium was on working towards achieving "Millennium Development Goals 4 and 5."

Members of MIRA and our Principal Collaborator Prof. Anthony Costello have received prestigious awards for their outstanding contribution in the field of health research and newborn care in Nepal.



Introduction

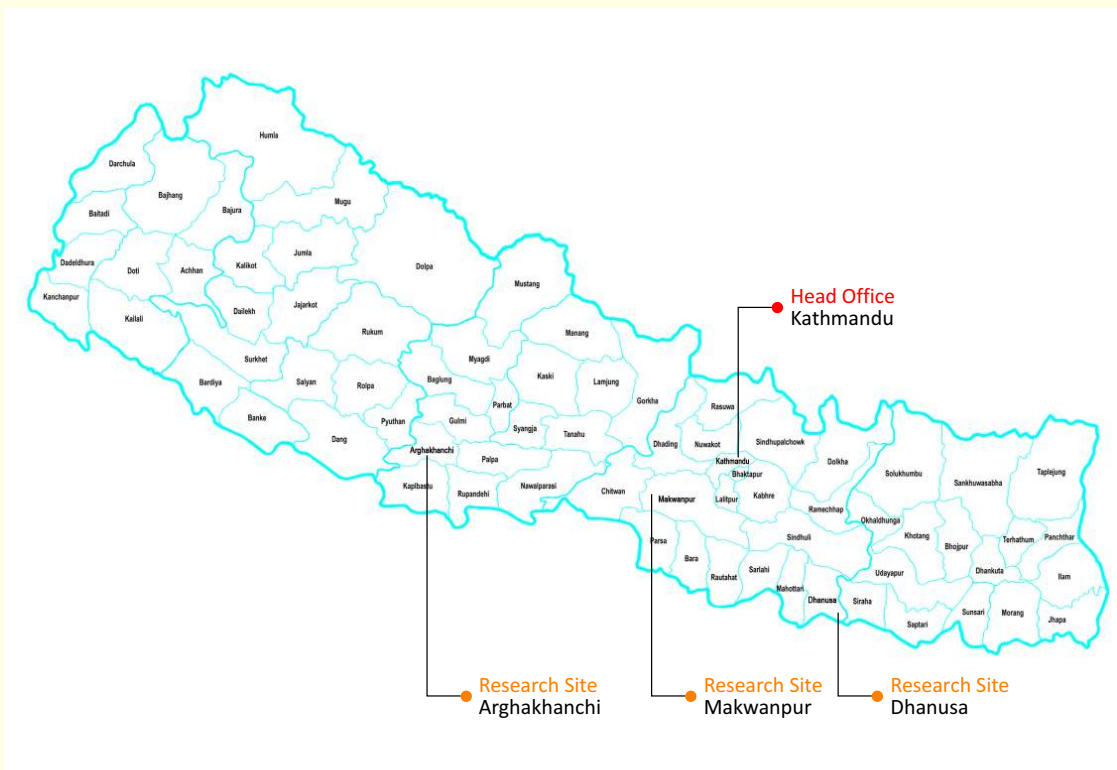
Mother and Infant Research Activities (MIRA) is a national, non-government, non-profit organization with its central office in Thapathali, Kathmandu. It was established in 1992 A.D. by a group of leading perinatologists of Nepal led by Prof. Dharma S. Manandhar following an initiative from Prof. A. Costello of the UCL Institute of Child Health, London.

Dedicated to improve maternal, neonatal and infant health through research and development of cost

effective interventions, MIRA plays an important role in addressing health concerns faced by mothers and infants in Nepal. MIRA conducts research, training, service and advocacy for improving maternal and infant health in Nepal and developing countries.

In the beginning, MIRA's activities were limited to Kathmandu valley. Later, it extended its field activities in Makwanpur district (1999), Dhanusha district (2002) and Arghakhachi district (2010).

Head Office and Research Sites of MIRA



Objectives

- To carry out research for the development and promotion of maternal and infant health.
- To use the results of research activities for the welfare of mothers and infants.
- To expand programs proven to be successful in reducing maternal and infant mortality and morbidity, by working with government and non-government organizations.
- To advocate improving maternal and infant health.



Mission Statement

To improve the health of mothers and newborn babies and reduce maternal and neonatal morbidity and mortality through research, training, service and advocacy.

MIRA has conducted several studies in close collaboration with the UCL, Centre for International Health and Development, ICH, London to investigate the important causes of maternal and neonatal health problems in Nepal. The studies so far completed are on perinatal nutrition, birth asphyxia, multiple micronutrient supplementations in pregnant women and participatory women's groups to reduce neonatal and maternal mortality. The results of these studies have been published in national and international journals including the 'Lancet'.

Activities

- ↳ Research
- ↳ Training
- ↳ Development of Perinatal Training Resource Centre
- ↳ Advocacy
- ↳ Publications



Research

One of the major objectives of MIRA has been in conducting different types of studies related to maternal and infant health since its establishment. MIRA initiated with a small scale hospital based studies in Kathmandu valley. Later the scope of MIRA's research activities was quickly broadened to include large community based studies for improving child survival and maternal health in two districts – Makwanpur and Dhanusha. Recently, MIRA has extended its research activity to Arghakhanchi district. Major research activities are given below:



1. Maternity Hospital Thapathali (Prasuti Griha):

- a. **Study on perinatal nutrition (1992-3):** This study done on mothers and newborns of Prasuti Griha, showed high incidence of LBW (32%) among the newborns and hypoglycemia (48% in the first 48 hours of life). It also showed significant poor nutrition among the mothers.
- b. **Case control study on birth asphyxia (1993-6):** A study done on babies born at the hospital has revealed neonatal encephalopathy in 6.1% newborns which is much higher than in developed countries. One of the important factors associated with neonatal encephalopathy has been the use of uterotonic drug without proper supervision and timely intervention.
- c. **Randomised controlled trial on the retention of health education given to mothers within 48 hours of delivery on important aspects of child care and family planning - immunisation, diarrhea, acute respiratory infection, breast feeding and family planning:** This trial showed that number of mothers who were able to recollect the given information after 6 months was not significant.

2. Makwanpur District (1999-2012):

- a. **Cluster Randomised Controlled Trial (RCT) on the effects of Participatory Women's Group on maternal and newborn health (1999-2009):** In this study participatory women's groups were actively engaged to discuss on the problem identification, prioritization, implementation of community based interventions and evaluation with the help of a facilitator on maternal and newborn health in 12 VDCs and without any such activity in the other 12 VDCs. This study revealed a 30% reduction in neonatal mortality. This is the first study done on such a large scale with cluster randomization which showed such an impact on neonatal mortality reduction by community mobilization and participation.
- b. **Community mobilisation and health management committee strengthening to increase birth attendance by trained health workers in rural Makwanpur, Nepal: A cluster randomised controlled trial:** The main objective of the study is to find out whether community mobilisation by women's groups facilitated by FCHVs and strengthening of health management committees would enhance deliveries in health facilities or by trained health workers at

home. This is still ongoing and we expect to complete it in a year or so.

- c. Impact of maternal disability on exclusion, birth outcomes and child health:** This study was done in 30 VDCs of Makwanpur district and was completed in 2011. A total of 13,683 women were interviewed and this is the largest study done on this topic. The main findings were - 30% of women had some sort of disability, but 6% of the women had severe disability. While there is no significant difference between disabled and non-disabled women on the antenatal visit, place of delivery and the number of children, there was however higher neonatal mortality among babies of severely disabled women. It was also found that comparatively more disabled women were attending women's groups. UCL Leonard Cheshire Disability & Inclusive Development Centre provided technical support in this study.

3. Dhanusha District (2002-2012)

- a. Double blind randomised controlled trial on the effects of multiple micronutrient supplementation in pregnant women on birth weight, gestation and neonatal and perinatal mortality rates (2002-2004):** Out of 1200



pregnant women enrolled in this study, 600 were randomly allocated to receive multiple micronutrients and 600 to iron and folic acid tablet. This study showed that the birth weight of babies born to mothers who received multiple micronutrients were on an average 77 grams heavier compared to babies whose mothers received iron and folic acid tablet. This supplementation also helped to reduce LBW incidence by 25%. There was no statistically significant effect on length, head circumference, gestational age of the baby and neonatal and perinatal mortality rates among the two groups. Follow up studies of these babies were carried out at 2 years of age and now a 9 year follow up study is being carried out on the long term effects of multiple micronutrient supplementation in antenatal period on growth and development of these babies.

- b. Cluster randomised controlled trial on the effects of participatory women's groups facilitated by local female community health volunteers on neonatal and maternal mortality and change in nutritional behaviour (2005-2011):** These studies are just recently completed and data are being analysed.

- c. **Use of FCHVs in the identification and management of neonatal sepsis by providing oral amoxicillin at home and referring the babies to health facilities to receive parenteral gentamicin (2005-2011):** This study is also recently completed and data are being analysed.
- d. **Formative research on better early infant growth and childhood development in Nepal (2012):** This study has been just started and we hope to complete by the end of this year.

Operational Research in Arghakhanchi District (In collaboration with Health Right International) (2010-2013)

This operational research is an evaluative study of quality, utilization, and maternal and neonatal health related knowledge and care seeking behavior in the intervention area, compared to CB-NCP only implementation area of Arghakhanchi district. HealthRight International is implementing Community Based Newborn Care Program (CB-NCP) in the whole district of Arghakhanchi while the intervention is implemented in the electoral area 2 of the district. The study will be completed in 2013.

Other important studies

A multiple hospital based study on Prevalence and Factors associated with Low Birth Weight in four regions of Nepal was done in 2000 in collaboration with UNICEF, Nepal. This study showed a LBW prevalence rate of 27%, out of which 2/3 LBW babies were small for dates and 1/3 were preterm LBW. The four hospitals in which this study was carried out were - Prasuti Griha, Kathmandu, Koshi Zonal hospital, Biratnagar, Gandaki Zonal hospital, Pokhara and Bheri Zonal hospitals, Nepalgunj.

Training

Since 1997, MIRA has shared its knowledge about maternal and neonatal health to various cadres of health workers in Nepal through various training programs. The details about the training provided are highlighted below:

- ENC training was carried out in 10 district hospitals in collaboration with National Safer Motherhood Project.
- ENC training was carried out in collaboration with PLAN and CARE Nepal.
- ENC training was carried out in collaboration with Merlin in Salyan district.



- ENC training was given to all the health facility staff and community health volunteers in Makwanpur and Dhanusha districts of Nepal.
- Participatory Learning Approach to the staff of UMN and AMDA, Nepal
- Training on emergency obstetric care in Makwanpur district.
- Training on ENC, Maternal and Perinatal verbal autopsy carried out in Arghakhanchi district in collaboration with HRI.

Development of Perinatal Training Resource Centre

Perinatal training resource centre was established in 2002 with support from Women and Children First, an NGO in the United Kingdom. The major achievements of the project are:

- MIRA, in collaboration with National Health Training Centre, developed training materials on newborn care for different cadres of health workers.
- Established a Perinatal and Resource Training Centre in MIRA office in Kathmandu.



Advocacy

MIRA has been active in translating the knowledge from research into policy. Members of MIRA have been involved as core members of government committees. Some of the major contributions of MIRA are listed below:

- An international workshop on “Improving Health of the Newborn Infants in Developing Countries” was held in Kathmandu in April 1997 where leading perinatologists and neonatologists from SAARC region and abroad participated. Later the proceedings of the conference was published as a book.
- Some of the Executive Members of MIRA got involved in Safe Motherhood and Newborn care policy and plan of the Government of Nepal.
- Similarly some of the Executive Members contributed significantly in the development of Government's National Neonatal Health Strategy 2004.
- Again some of the Executive Members were involved in the formulation of Community Based Newborn Care Programme of the Ministry of Health and Population of the Government of Nepal.

MIRA members played a very significant role in the establishment of Perinatal Society of Nepal (PESON) in 1997. Since then, MIRA has been co-hosting pre and post conference workshops during the conferences of PESON.



Innovations

MIRA promotes maternal and infant health by developing realistic and cost effective interventions. Locally made, low cost essential equipment for Newborn Care have been designed by Prof. Dharma S. Manandhar, President of MIRA. These equipments are cheap, easy to operate and maintain. These have been used in many district hospitals, some medical colleges and private hospitals as well.

Publications and Presentations

In line with the objective of providing resource material on perinatal health, MIRA has made several films and publications including books, chapters in the books and articles in national and international journals. A brief overview of list of publications is highlighted below:

Films

Films on *Birth of a Baby*, *Community Mobilisation and Nutritional Education* have been produced and screened in the communities to bring awareness and behaviour change.



Articles

Over 70 articles have been published in national and international peer reviewed journals.



DSM RESUSCITAIRE

It is used for resuscitation and routine care of the baby in the labour room. The two overhead lamps keep the baby warm.



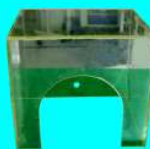
DSM WARM COT

Simple wooden framework with glass window at the top and the front and holes at the bottom and sides for ventilation. It also has two 60 watt bulbs on the bottom compartment to keep the baby warm.



DSM PHOTOTHERAPY UNIT

An equipment with metallic frame and six tube lights, three blue and three white lights. It is used for treating neonatal Jaundice.



DSM OXYGEN HOOD

It is used for providing oxygen to the baby.

Books

Improving Newborn Infant Health in Developing Countries. Eds.: Anthony Costello and Dharma S. Manandhar, Imperial College Press, 1999

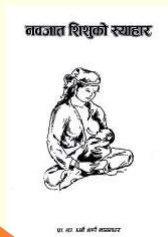
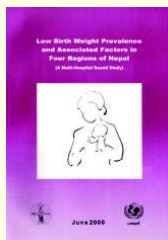
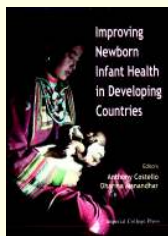
Essential Neonatal Care 1996, Dr. Dharma S. Manandhar, published by Nepal Pediatric Society

Navajatshishuko Syahar (Nepali), Dr. Dharma S. Manandhar

Navajatshishuko Aadharbhut Shyahar (Nepali), Dr. Dharma S. Manandhar

Pictorial book on newborn care

Perinatal Game Card for use by Participatory Women's groups



Presentations

Many presentations have been given in important national and international conferences, workshops and seminars.



(Please visit our website : www.mira.org.np for more details.)

Other Important Collaborative Activities

In Collaboration with Extended Service Delivery of Pathfinder International/USAID

The main aim of this project was to identify five best practices to improve maternal and newborn health in Nepal and then to disseminate these best practices to important stake holders in the country by organizing workshops in five regions of the country and providing opportunities to have experience of the best practice onsite. This project has helped a large number of participants from the government and non-government sectors to understand about the five best practices which have been found very useful in improving the health of the mothers and infants in Nepal.

Membership and Collaboration

MIRA was a member of a research consortium called "Towards 4+5" which aimed to improve maternal, neonatal and infant health of the developing countries.



This was supported by Department for International Development (DFID) UK.

The consortium consisted of University College London, Centre for International Health and Development, London, London School of Hygiene and Tropical Medicine UK and leading research organisations of Nepal (MIRA), Bangladesh (PCP-BADAS) and (ICDDR), Malawi (Mai Mwanwa), Ghana (Kintampo Health Research Centre), Burkino Faso (Centre MURAZ/ GREFSad/AFRICSante). The purpose of the Towards 4+5 Research Programme Consortium is to support evidence-based policy and practice for maternal and newborn health and to facilitate the achievement of the Millennium Development Goals 4 and 5.

The core outputs of the programme are: to generate new evidence to improve the survival of women and infants through community interventions and health service delivery; to influence policy and management decision making on large scale programmes for maternal and infant mortality, and to increase the capacity in partner countries for knowledge generation and policy influence.

Since 1992, MIRA has received support and collaborated with international organizations like Wellcome Trust, United Nations Emergency Fund Nepal, United Nations Fund for Population Activities Nepal, United Mission to Nepal, Nepal Safer Motherhood Project and Support for Safe Motherhood Project, CARE, The British Council, a Swiss private foundation, ESD, and HealthRight International.

Awards

President of MIRA, **Prof. Dharma S. Manandhar** has received several awards for the outstanding contribution in the field of health research and new born care in Nepal.

- Outstanding Researcher Award from Nepal Health Research Council, 2003
- NEPAS Oration, 2006
- Topmost award of Nepal Academy of Science and Technology for outstanding contribution on newborn care in Nepal, 2007
- NEPAS Life Time Achievement Award, 2012



(a)



(b)



(c)

(a) Receiving Outstanding Researcher Award from NHRC - 2003

(b) Receiving Topmost Award of Nepal Academy of Science and Technology from the Prime Minister G. P. Koirala, 2007

(c) NEPAS Life Time Achievement Award bestowed by Rt. Hon'ble President Dr. Ram Baran Yadav

Capacity Building

In collaboration with UCL, CIHD, Institute of Child Health London MIRA has been involved in capacity building of its staff by providing opportunities for short course training, postgraduate studies and doctoral degree in the United Kingdom and other countries. List of participants from MIRA who attended various capacity building courses are presented below:

M.Sc./Ph.D. in Maternal and Child Health from ICH London and Europe



Dr. Nilu Manandhar
(1996)



Mr. Bhim Prasad Shrestha
(2002)



Mr. Kirti M. Tumbahangphe
(2003)



Miss Sushma Thapa
(2004)



Mr. Suresh Tamang
(2005)



Mr. Shyam Lal Shrestha
(2006)



Dr. Anjana Vaidya
(Ph.D. 2009)

International Students who completed their MD/Ph.D. following their work in MIRA research sites



Dr. Alison Bolan
(MD, 2000)



Dr. Matthew Ellis
(Ph.D., 2000)



Dr. Jo Borghi
(Ph.D., 2006)



Dr. David Osrin
(Ph.D., 2006)



Dr. Joanna Morisson
(Ph.D., 2009)



Dr. Pascal Odent
(Ph.D., 2011)

International Students pursuing Ph.D. with field work in MIRA research sites

- Nasima Akhtar
- Shizuka Amano
- Kelly Clarke
- Dr. Delan Devakumar

Executive Committee (2011-2013)

President



Prof. Dr. Dharma S. Manandhar
Head, Department of Pediatrics
Kathmandu Medical College

Vice President



Dr. Ramesh K Adhikari
Professor of Pediatrics
Institute of Medicine

Secretary



Dr. Prakash S. Shrestha
Professor of Pediatrics
Institute of Medicine

Treasurer



Mr. Jyoti R. Shrestha
Sr. Public Health
Officer

Members



Dr. Kasturi Malla
Sr. Consultant Obstetrician
Gynecologist



Dr. Banshi K. Malla
Sr. Ophthalmologist



Dr. Sunil R. Manandhar
Lecturer in Pediatrics
Kathmandu Medical College

Principal Collaborator and Technical Advisors from UCL, CIHD, UK



Prof. Anthony Costello
Principal Collaborator



Dr. David Osrin
Technical Advisor



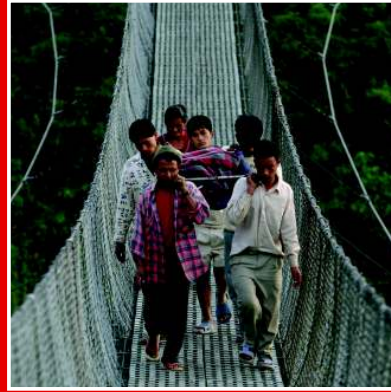
Ms. Natasha Mesko
Technical Advisor



Dr. Naomi Saville
Technical Advisor



Dr. Joanna Morrison
Technical Advisor



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