icddr,b gratefully acknowledges the support of its core donors

icddr,b is an international public health research institution that is dedicated to developing practical, low-cost solutions to the health problems of people living in poverty in Bangladesh, where the institution is based, and around the globe. icddr,b’s proximity to the health challenges of the developing world, both rural and urban, allows for the development of interventions that are rigorously-tested, scalable in resource-limited settings and, most importantly, can improve the health outcomes and well-being of individuals living in low-income countries.
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icdbr’s history is filled with examples of our impact on global health through research innovations and discoveries and influence on health policies in Bangladesh and beyond. 2011 has been a transitional year as we continue to put in place the necessary structures and business processes to ensure a continued legacy of discovery and policy influence. Our core donors have recognised our restructuring efforts as nothing short of transformational.

The creation of 10 centres reflecting our research priorities serves as the fulcrum point of the reorganisation. We have made significant steps forward in this regard, and all the centres are now fully operational. We have also continued to modernise our business processes and create a robust monitoring and evaluation system, both of which I believe are essential to support our science base and maintain a high standard of stewardship of our donors’ investments. These systems, tested by almost 30 separate audits conducted by internal and external auditors in 2011, demonstrate our long-standing commitment to transparency and accountability.

Improving the speed of knowledge translation from discovery to scale-up and policy is essential if we are to make significant strides in addressing both persistent and emerging public health issues. Our researchers share a commitment to publish, advocate for change and offer technical assistance and training to ensure that knowledge is available to fellow researchers, implementers and policymakers. In 2011 alone, we contributed over 200 papers in international publications including the BMJ and The Lancet, trained almost 2000 people from around the world, and offered technical assistance to the Government of Bangladesh and other governments in the region.

icdbr continues to welcome visitors to our hospitals, field sites and laboratories to observe and learn from our day-to-day practices. This year, we were privileged to host visits from HRH Princess Anne of the United Kingdom and the UN Secretary-General, Ban Ki-moon as well as government ministers, ambassadors and members of the GAVI Alliance Board. Their very presence, as well as their words of praise and acknowledgement, encourage us and remind us that our work benefits not only the people of Bangladesh, but is also relevant beyond national borders.
To support our science, we have intensified our global communications, advocacy and fundraising efforts. We want to showcase our work on a wider international stage to ensure dissemination of our life-saving discoveries among key public health institutions, as well as to gain greater access to funds. In September, we announced two commitments at the Clinton Global Initiative, including one on cholera outbreak preparedness. This was a featured commitment and showcased an innovative model for icddr,b to respond with technical assistance during cholera outbreaks, such as the recent one in Somalia. New partnerships with the US humanitarian organisations AmeriCares and MedShare are delivering donated medical supplies and equipment to icddr,b’s hospitals and clinics. We have been successful in developing new funding relationships with globally recognised donors such as the Conrad N. Hilton Foundation. We have nurtured and deepened our relationships with existing core funders. AusAID has increased their funding for the next five years and we are in the final stages of renegotiating contracts with our other core donors—Sweden, Canada and the United Kingdom.

Over the past two years, there has been a concerted effort to modernise and strengthen icddr,b so that we can focus on our research agenda and continue to contribute to the global endeavour to generate and translate research into policy and practice. There is still much work to do, but with the support of our Board of Trustees and the leadership of our centre directors, I look forward to continuing the implementation of our strategic plan.

Dr. Alejandro Cravioto

Dr. Cravioto and Dr. Tahmeed Ahmed describe icddr,b's development of a locally-produced 'Ready to Use Therapeutic Food' to UN Secretary-General, Ban Ki-moon during his visit to icddr,b in November, 2011
Our Research Priorities

icddr,b offers an exceptional multi-disciplinary research environment in which scientists and health professionals cooperate on research, treatment, training and policy development. The range of expertise and disciplines under one roof is a major strength for icddr,b and our new 10-centre research structure, which became fully operational in 2011, is designed to facilitate maximum cooperation.

icddr,b’s new strategic plan reinforces its legacy of focusing not just on discovery, but also on strengthening the organisation’s ability to shape policy at the national, regional and global level, as well as advocating for the use of highly effective products and evidence-based discoveries. icddr,b reinforces these efforts through publishing and South-South collaboration, training and capacity-building, and continues to build a cadre of public health experts and capacities for low- and middle-income countries. In addition, strategic national, regional and global partnerships tap into the complementary assets of other organisations—academic, scientific, NGOs and private sector—to maximise the influence and reach of icddr,b’s work.

Research Centre Directors

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<td>Dr. Hubert Endtz</td>
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<td>HIV &amp; AIDS</td>
<td>Dr. Tasnim Azim</td>
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<td>Dr. Laura Reichenbach</td>
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RESEARCH

icddr,b researchers are dedicated to developing practical, low-cost, scalable solutions to address the most pressing global public health concerns, from neonatal survival to infectious and chronic diseases. Our research ability is distinct because of our proximity to the health challenges affecting those living in rural and urban poverty, particularly women and children.
COMMUNICABLE DISEASES

Oral Rehydration Solution (ORS) established icddr,b’s reputation as a public health research institution and, specifically, its expertise in communicable diseases and low-cost solutions. While the breadth of research and expertise at icddr,b is now much broader, the institution continues to be regarded as a global resource for diarrhoeal, enteric and other communicable diseases. The history, the expertise of staff and the access to some of the most significant communicable diseases of our time enable icddr,b to maintain its reputation as a global expert.

ICDDR,B BEGINS WORLD’S LARGEST ORAL CHOLERA VACCINE STUDY

In February 2011, icddr,b began work on the largest feasibility study of the effectiveness of an oral cholera vaccine so far undertaken. This groundbreaking research examines the effectiveness of Shanchol, a low-cost, oral cholera vaccine, in combination with behaviour change communications and water and hygiene interventions. A multi-disciplinary team composed of scientists from icddr,b’s vaccine sciences and communicable diseases research centres is running the study, and will evaluate the overall impact of this combination of interventions in decreasing the incidence of diarrhoea due to *Vibrio cholerae*.

The *Introduction of Cholera Vaccine in Bangladesh* (ICVB) project is taking place in the slums of Mirpur, a northwestern suburb of Dhaka. Due to poor sanitation and a lack of clean water, the inhabitants of Mirpur’s slums are susceptible to cholera infections and account for almost a quarter of icddr,b’s cholera patients each year. The study population includes 240,000 persons in 90 clusters. Approximately 80,000 persons in 30 clusters will receive the cholera vaccine alone; people in 30 clusters will receive both cholera vaccine and behaviour-change intervention messages, and those in another 30 clusters will serve as the control, maintaining their standard habits and practices.

icddr,b initiated the vaccine delivery in February 2011. By mid-April, 265,000 vaccine doses had been administered to approximately 142,000 people, with 87% of first dose recipients also receiving the second dose of the vaccine. No serious adverse effects were observed.

In June 2011, scientists from icddr,b’s communicable diseases research centre, working with a local NGO—DSK—began a handwashing campaign among people in selected clusters, while the promotion of safe point-of-use water treatment began three months later. Data on handwashing and water treatment practices, as well as diarrhoea and respiratory diseases, are collected each month from the three study groups: vaccine-only households, vaccine plus behaviour-change households and the control households. Early results concerning the rate of handwashing in behaviour-change households appear encouraging. icddr,b is also conducting passive surveillance at 10 healthcare facilities in Mirpur linked to icddr,b’s hospital data management system. A preliminary report assessing the programme’s effectiveness will be available by the middle of 2013.

Thanks to initial results produced from the study, Partners in Health is now conducting a 50,000-person pilot project with two doses of Shanchol vaccine in Haiti. In addition, scientists from icddr,b are sharing early results with two groups within the World Health Organization focused on cholera prevention and treatment.

A child receiving oral cholera vaccine in Mirpur during the mass cholera vaccination programme
Plastic containers store chlorinated water for households enrolled in the handwashing and behaviour-change component of the Introduction of Cholera Vaccine in Bangladesh study.
EFFECT OF CLIMATE CHANGE ON CHOLERA OUTBREAKS

Past evidence has suggested that algae in water sources could serve as a reservoir for cholera bacteria. As the global temperature rises, which is linked with increased algal bloom production throughout the world, increased cholera outbreaks could pose a significant challenge for future communities.

To test this idea, a field-based study was carried out to determine whether algal blooms coincide with cholera cases in the Matlab sub-district of Bangladesh. Water samples were collected at 15-day intervals from a pond used extensively for household water, and algae content was measured in each sample. At the same time, cholera cases reported to the icddr,b hospital in Matlab were tabulated from medical records.

A statistically significant association was found between algal concentrations in the pond and cholera cases in the area. The study provides further evidence that algal blooms are associated with cholera outbreaks. It also sheds light on the possible impact of increasing algal blooms in many regions of the world on the epidemiology of cholera. In addition, it points to further research needed on the likely role of landscape transformation, chemical fertiliser use, and regional climate change as anthropogenic factors that drive these ecological trends.

ANTIBIOTIC-RESISTANT ‘SUPERBUGS’ IDENTIFIED IN BANGLADESH

A new strain of multidrug-resistant bacteria, commonly called ‘superbugs’, recently emerged in India and has spread throughout the world, including Bangladesh. Growing rates of infection with this strain of superbug, called NDM-1, has caused much alarm in the global medical community since it is resistant to most antibiotics for treatment. Patients are often infected while receiving medical treatment in hospitals and clinics. Understanding the spread of new strains of superbugs is crucial to developing solutions for treatment and halting its global spread.

Scientists at icddr,b conducted the first systematic surveillance on NDM-1 in Bangladesh. In addition, they contributed to the scientific characterisation of this superbug through research. Using icddr,b’s advanced laboratory facilities, researchers were able to test clinical samples for NDM-1 from local hospitals and clinics. In total, 1,816 consecutive clinical samples were tested for the strain.

The study found that approximately 3.5% samples had signs of NDM-1, showing a significant rate of infection. Results of the study were published in the European Journal of Clinical Microbiology and Infectious Diseases.

Dr. Md. Sirajul Islam (centre), Head of Environmental Microbiology showing his team how to prepare and test the algal sample for detecting Vibrio cholerae
**SHAPING GLOBAL HEALTH POLICY ON CHOLERA**

Public health researchers and policy-makers need to collaborate if evidence is to be translated into successful policy decisions, and knowledge into actions to improve public health at a national and global level.

It was the development of a low-cost, highly effective treatment for cholera that first brought icddr,b to the attention of public health experts worldwide. In May 2011, delegates gathered in Geneva, Switzerland for the 64th World Health Assembly approved a resolution on mechanisms to control and prevent cholera, after acknowledging that cholera is an escalating global health issue with climate change contributing to an increasing number of outbreaks. The Assembly praised the Government of Bangladesh for its leadership in getting the resolution passed: first by the Executive Board and subsequently by the General Assembly of WHO. For icddr,b, this resolution is a significant achievement and is an example of research knowledge informing global policy. It followed several years of advocacy and close collaborations aimed at finding new ways to control and prevent the disease.

**HAITI REPORT RECOMMENDS SCREENING PEACEKEEPERS**

In 2011, icddr,b's executive director, Dr. Alejandro Cravioto, chaired an independent panel tasked with assisting the United Nations in determining the source of the 2010 cholera outbreak in Haiti. The panel’s investigation led to a report concluding that the cholera outbreak was a result of inadequate sanitation facilities belonging to UN peacekeeping forces stationed near the Artibonite River, but was also due to a series of circumstances that included the poor water and sanitation infrastructure in the island nation, a breakdown in health services and a lack of medical supplies. The panel based their findings on a review of the genetic and epidemiological data as well as a study of the sanitation system of a UN camp near the site of the first cholera cases. The report made a series of recommendations to prevent similar epidemics from happening in the future. One example is ensuring the screening of UN personnel hailing from cholera-endemic areas for the presence of *Vibrio cholerae*. The four-member panel included two other scientists with strong ties to icddr,b; former Board of Trustees member Dr. Claudio Lanata and former head of icddr,b’s Laboratory Sciences Division Dr. G. Balakrish Nair.
PUTTING TYPHOID BACK ON THE PUBLIC HEALTH AGENDA

Typhoid fever is caused by bacterial infection in the intestinal tract and occasionally the bloodstream. The emergence of an antibiotic-resistant typhoid strain and a scarcity of early diagnostic tools present major obstacles to the fight against the disease in Bangladesh. Although typhoid is more prevalent in the country’s rural areas, its presence is not insignificant in urban communities. This key finding was one of several presented during a seminar jointly organised by icddr,b and the Bangladesh Paediatric Association in November 2011, intended to put typhoid back on Bangladesh’s health agenda.

Surveillance at icddr,b’s Dhaka Hospital was carried out from February 2008 until October 2011. With approximately 916 typhoid strains detected in patients, the surveillance demonstrated a significant increase in figures observed before 2008. The icddr,b researchers also warned that typhoid is becoming increasingly drug-resistant. Data collected from an ongoing urban typhoid surveillance initiative in Dhaka’s southern suburb of Kamalapur, an area traditionally prone to the disease, revealed that 100% of detected strains are resistant to three drugs: β-lactams, chloramphenicol and cotrimoxazole, of which 49% are also resistant to nalidixic acid.

This increased resistance makes treating typhoid with traditional antibiotics highly problematic. Our scientists are currently promoting a new technique that uses ‘antibodies in lymphocyte supernatant’ (ALS) to diagnose typhoid fever and significantly reduces the time required for detection. An additional benefit is the technique’s potential to cut diagnostic costs for patients and healthcare clinics alike.

A mother responds to queries from a staff member at the Kamalapur urban surveillance site where typhoid prevalence is being studied.

Approximately 5% of people who contract typhoid continue to carry the disease after they recover.*

* Source: Centres for Disease Control and Prevention, USA
Each week, icddr,b field research assistants visit homes in Kamalapur to screen for illnesses and make clinical referrals. Kamalapur is a densely-populated, low-income urban area in the south of Dhaka.
WORLD’S LARGEST STUDY OF CHILDEHD PNEUMONIA LAUNCHED

Pneumonia remains the leading infectious cause of childhood deaths around the world, accounting for more than 1.5 million child deaths per year, with 98% of these deaths occurring in developing countries. Yet until last year, a major study of the causes of childhood pneumonia had not been conducted since the 1980s.

In November 2011, scientists from icddr,b’s communicable diseases research centre began work on the groundbreaking Pneumonia Etiology Research for Child Health (PERCH) study. Funded by the Bill & Melinda Gates Foundation, the study will systematically look at current and likely future causes of childhood pneumonia in some of the world’s hardest-hit populations. With a goal of enrolling more than 12,000 children from seven different countries, PERCH is the largest international study of its kind to take place in the last 20 years.

Coordinated by the International Vaccine Access Center at the Johns Hopkins Bloomberg School of Public Health, PERCH involves research sites in Bangladesh, Thailand, Gambia, Kenya, Mali, South Africa and Zambia. Among the collaborating universities are New Zealand’s University of Otago and Canterbury Health Laboratories who are providing laboratory support. Recent breakthroughs in laboratory testing mean that the PERCH study will be able to identify infections that might have been missed in the past and perhaps even discover new, previously unknown viruses and bacteria.

icddr,b’s research will be conducted at its urban surveillance site in Kamalapur, to the south of Dhaka city. Kamalapur is three times more densely populated than Manhattan, has an average of 81,330 individuals per sq. kilometre and as many as 300,000 individuals per sq. kilometre in some clusters. The presence of severe pneumonia in such a densely populated area, combined with icddr,b’s world-class research capacity, makes it an ideal location for such an investigation.
icddr,b’s headquarters are in Dhaka, Bangladesh’s capital, but its scientists conduct research across the country. The institution runs nine field sites: two urban and seven rural. These include Matlab, which is the oldest continuously-running health and demographic surveillance site in the developing world. In collaboration with the Institute of Epidemiology, Disease Control and Research (IEDCR), icddr,b has also established a surveillance network of public and private hospitals across Bangladesh, which allows scientists to monitor the prevalence of diseases, including cholera and influenza.

**Field Sites**
- 1. Mirpur (Dhaka)
- 2. Kamalapur (Dhaka)
- 3. Mirzapur (Tangail)
- 4. Matlab (Chandpur)
- 5. Kanaighat (Sylhet)
- 6. Bienibazar (Sylhet)
- 7. Jakiganj (Sylhet)
- 8. Bandarban
- 9. Chakaria (Cox’s Bazar)

**Influenza Surveillance Network**
- A = LAMB Hospital, Dinajpur
- B = Shaheed Ziaur Rahman Medical College Hospital, Bogra
- C = Community Based Medical College Hospital, Mymensingh
- D = Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet
- E = Rajshahi Medical College Hospital
- F = Jahurul Islam Medical College Hospital, Bajitpur
- G = Jessore General Hospital
- H = Khulna Medical College Hospital
- I = Sher-e-Bangla Medical College Hospital, Barisal
- J = Dhaka National Medical College Hospital
- K = Comilla Medical College Hospital
- L = Bangabandhu Memorial Hospital, Chittagong

**Diarrhoeal Disease Surveillance Hospitals**
- i = Dhaka Hospital, icddr,b
- ii = Mirpur Treatment Centre, icddr,b
- iii = Kumudini Hospital, Mirzapur
- iv = Chhatak Upazila Health Complex
- v = Matlab Hospital, icddr,b
- vi = Mathbaria Upazila Health Complex
EXPERTS IN EMERGING INFECTIOUS DISEASES

In 2011, icddr,b provided technical support to the Government of Bangladesh in 16 different emerging infectious disease outbreaks, including outbreaks of Nipah encephalitis, anthrax, cholera, shigellosis, hepatitis E, and influenza A H5N1 in humans and birds. In each case, icddr,b collaborated closely with the Government of Bangladesh to investigate the outbreaks, implement measures for prevention and control and assist in disseminating the findings. As well as responding to emergency situations, icddr,b works with the Institute of Epidemiology, Disease Control and Research (IEDCR) at the Ministry of Health and Family Welfare to maintain sophisticated surveillance systems to detect disease outbreaks with a particular focus on respiratory disease and encephalitis (see page 13).

STOPPING THE SPREAD OF NIPAH VIRUS

In January 2011, five villagers from Hatibandha upazila, in the north of Bangladesh, died of a mysterious illness that was spreading through the local population. As the number of infections multiplied, the IEDCR and icddr,b deployed a joint investigation team including veterinarians, an anthropologist and medical staff to the affected area. Within a week, the team confirmed that the deaths had been caused by Nipah virus.

Nipah virus symptoms—fever, headache, and unconsciousness—usually appear within six to 11 days after exposure and the case fatality is >70%. Pteropus giganteus or ‘fruit bats’ are the natural reservoir for Nipah virus, and humans in Bangladesh have become infected through consuming raw date palm sap contaminated with bat saliva or droppings. Nipah also can spread from human to human through close contact with Nipah patients, particularly their respiratory secretions. Given the disease’s deadly nature, icddr,b’s support to the Government has been critically important in better understanding and responding to this public health threat.

Investigation & Surveillance

Bangladesh is vulnerable to emerging infectious diseases, particularly zoonotic diseases; those transmitted between humans and animals. These represent a major global public health risk. The Government of Bangladesh routinely calls on the technical and scientific expertise of icddr,b researchers to respond to disease outbreaks and public health emergencies.

DISEASE OUTBREAKS INVESTIGATED BY ICDDR,B/IEDCR TEAM IN 2011

A = CHAPAI NAWABGANJ
Chikungunya (Nov 11)

B = MEHERPUR
Anthrax (Jul 11)

C = SATHIA
Anthrax (Apr-Jun 11)

D = JOYPURHAT
Anthrax (Aug 11)

E = BANDARBAN
Measles (Apr 11)

F = ULLAHPARA
Anthrax (May-Jun 11)

G = SHAHAJ ADPUR
Anthrax (May-Jun 11)

H = FARIDPUR
Anthrax (May-Jun 11)

I = POTUAKHALI
Influenza H5 (Jan-Feb 11)

J = LALMONIRHAT
Nipah (Feb 11)

K = TANGAIL
Suspected pesticide poisoning (Apr 11)

L = DHAKA
H5N1 (Bird flu) (Mar 11)

M = NETROKONA
H5N1 (Bird flu) (Jun-Jul 11)

N = KISHORGONJ
Cholera (Apr 11)

O = CHITTAGONG
Cluster of sub-acute encephalitis (Jun 11)

P = BANDARBAN
Measles (Apr 11)
SURVEILLANCE SYSTEM DETECTS CASES OF AVIAN INFLUENZA

As the world’s most densely populated nation, it’s no surprise that avian influenza tops Bangladesh’s list of public health concerns. Since the first detected case in Bangladesh in 2007, icddr,b, IEDCR and the US Centers for Disease Control and Prevention have collaborated to manage a sophisticated influenza surveillance network made up of 12 public and private hospitals across Bangladesh.

In March 2011, Bangladesh’s Ministry of Health and Family Welfare reported a confirmed human case of avian influenza A (H5N1) in a 16-month old baby girl from Kamalapur, in the south of Dhaka city, when her parents brought her to an influenza surveillance centre jointly operated by icddr,b and IEDCR. Two days later, a two-year-old boy from the same area received an identical diagnosis. Infections were confirmed in both cases following examination of naso-pharyngeal washes and blood samples. Both patients made a full recovery, requiring neither hospitalisation nor antiviral treatment.

Although no evidence of bird-to-human transmission of avian influenza has been reported in Bangladesh, icddr,b’s research also addresses this emerging global issue to avert an epidemic among humans. In the interest of early detection, icddr,b conducts passive surveillance collecting and analysing specimens from poultry suspected to be infected. Any infected or exposed birds are culled to stop further spread of the virus. Rapid identification of cases and influenza control by icddr,b and IEDCR make this surveillance system one of the most advanced in the developing world and a model for other countries.
Rigorous surveillance is vital to monitoring the spread of HIV in Bangladesh, to directing resources most effectively, and to undertaking HIV and AIDS advocacy and awareness-raising initiatives. Since 1998, icddr,b scientists have worked closely with Government of Bangladesh agencies including the Institute of Epidemiology, Disease Control and Research (IEDCR) to collect the data vital to keeping the HIV epidemic in Bangladesh under control.

In 2011, a cautious sense of optimism marked the release of data from The National Serological Surveillance for HIV—an annual survey conducted by the National AIDS/STD Programme in conjunction with icddr,b and IEDCR. Using data collected from 12,894 individuals in 36 different locations, the survey presents a comprehensive and detailed overview of the current rate of HIV prevalence in Bangladesh.

In keeping with previous editions, the survey's ninth round focused on the individuals most susceptible to contracting HIV: sex workers, people who inject drugs (PWID) such as heroin, males who have sex with males (MSM) and trangendered people known as hijra. Although HIV rates in Bangladesh have declined since 2008, the survey shows that certain segments of the population remain extremely vulnerable to contracting the virus.

In Dhaka, PWID continue to have the highest prevalence rates for HIV, although prevalence dropped slightly—to 5.3% from 7% during the eighth round. Fortunately, the epidemic has remained localised for several years, affecting one particular Dhaka neighbourhood. Overall, HIV prevalence was low among male and female sex workers and MSMs, although rates among the hijra appear to be rising and currently stand at 1.1%. The survey suggests that Dhaka has the highest prevalence of HIV, followed by the border towns of Hili in the northwest of Bangladesh and Benapole in the west. Increased vigilance in these areas is vital.
BUILDING NATIONAL CAPACITY TO FIGHT HIV/AIDS

IccdR,b’s Jagori Unit is the leading provider of care for patients with HIV and AIDS in Bangladesh. Working closely with UNICEF, the Jagori Unit conducts training courses and awareness-raising programmes for government health workers and support staff as a means of further reducing the prevalence of HIV and AIDS.

PIONEERING PREVENTION OF PARENT TO CHILD TRANSMISSION

Globally, prevention of parent to child transmission (PPTCT) is considered a successful way to eliminate HIV in newborns, and icddr,b’s Jagori Unit is proud to participate in this important undertaking. Jagori was among the first centres in Bangladesh to offer counselling services to HIV-positive pregnant women. It has also conducted counselling training sessions on PPTCT. With financial support from UNICEF, this project ran from the beginning of 2008 to the end of 2010. In 2011, follow-ups of 13 children with HIV-positive mothers confirmed that the children are all HIV-negative.

As a testimony to Jagori’s success in transferring knowledge to health workers, UNICEF approached Jagori again in 2011 to conduct a series of courses on PPTCT and infant feeding for doctors and nurses in Sylhet (in the northwest of Bangladesh). This included a five-day training course for 25 medical college professors working at the OB/GYN and paediatric departments of the MAG Osmani Medical College Hospital in Sylhet. In 2012, UNICEF hopes to set up a functional PPTCT service within this hospital, which will be a valuable addition to the HIV prevention efforts within Bangladesh, building national capacity in HIV management and prevention. Training provided by icddr,b is a crucial component of this plan.

DROP-IN CENTRE MANAGERS RECEIVE VITAL TRAINING

IccdR,b is the Principal Recipient of the Global Fund Project that provides HIV prevention services for MSM and hijra in Bangladesh through two NGOs—Bandhu Social Welfare Society and Light House. Services are provided through 65 drop-in centres in 40 districts of Bangladesh, which are established in the vicinity of community members. At the drop-in centres, clinical sessions are conducted thrice weekly for management of STIs and general health complaints. Trained physicians conduct two hour sessions using the syndromic management approach for STIs.

Managers of HIV/AIDS drop-in centres provide valuable support and guidance.
MOLECULAR ANALYSIS OF HIV STRAINS IN BANGLADESH
HIV-1 is responsible for every HIV infection detected in Bangladesh to date. HIV-1 is diverse; there are currently nine subtypes or sub-subtypes and 34 circulating recombinant forms. The majority of strains belong to subtype C. In a recent analysis of HIV-1 strains collected from surveys conducted between 2005 and 2007, from research studies and from clients attending icddr,b’s Voluntary Counselling and Testing Unit for HIV, icddr,b researchers were surprised to discover that 40% of all recorded HIV cases presented with non-C subtypes of the virus. Among the non-C subtypes, A1 represented 9%, B represented 4.5% with 86.4% comprised of several circulating recombinant forms detected. HIV strain diversity is, therefore, very high in Bangladesh, suggesting that HIV-1 has been introduced into Bangladesh from different sources with regularity.

VULNERABILITY OF BANGLADESHI STREET CHILDREN TO HIV
Estimates for the number of children living on the streets of Dhaka range from a half to two million. For these children, life is tough and violent. Those not living with family members must fend for themselves in order to survive, making them especially susceptible to sexual abuse and drug addiction. In 2011, icddr,b conducted a study in Dhaka to document the vulnerability to HIV and AIDS of street children aged from 5-12 years.

The study team used participatory play-based techniques to develop a more accurate and nuanced understanding of the children’s vulnerability. Through social mapping, participatory group discussions and individual interviews, the team observed street children in their local environment and daily activities to document their working and living conditions.

The findings revealed a high vulnerability to HIV/STIs. Out of 155 children interviewed for the study, 34% reported that they had been repeatedly raped by adult males while 40% said that they sold their bodies for sex. 56% of the children in this group were male. Drug use was common amongst street children. Out of 36 children interviewed individually, 75% described themselves as regular users of one or more types of drugs, with some injecting drugs. The vast majority of street children had no knowledge about STIs. A working paper has been published, and the results of this study have been shared with key stakeholders including the Ministry of Health and Family Welfare, the Dhaka City Corporation and relevant NGOs. The development of potential interventions is now being considered.
Children living on the streets in Dhaka are extremely vulnerable to sexual violence and drug abuse, putting them at high risk of HIV infections.
ICDDR,B PIONEERS USE OF OST IN BANGLADESH

icddr,b recently launched Bangladesh’s first study on using Opioid Substitution Therapy (OST) to reduce the risk of contracting HIV and other infectious diseases through injecting illicit drugs. This groundbreaking study was developed in collaboration with the Department of Narcotics Control and National AIDS/STD Programme with financial support provided by the UN Office on Drugs and Crime (UNODC) and FHI360. It comes after extensive advocacy by icddr,b to make OST a legal option for people who use drugs in Bangladesh. The study’s overall goal is to improve the quality of life and health of people who inject drugs (PWID). Since the beginning of the project in 2010, 150 clients have been enrolled. The pilot achieved remarkable success, as 11 PWID ceased injecting drugs. The following case study highlights OST’s achievement in assisting a highly motivated individual to finally become drug-free.

OST: A SUCCESS STORY

Labu* is a 48-year-old man working as a gardener-cum-caretaker at a mosque in Dhaka, making Tk 5,000 (US$60) a month. If you met Labu today, you might not know that his family had abandoned him. You might not know that this religious man had just completed a 13-month-long therapy for substance abuse. Though Labu never used cannabis, alcohol or the popular codeine-based cough syrup called phensidyl, he was addicted to opioids for 20 years, 17 years of which he injected drugs.

Labu started by using heroin, a habit that lasted for almost four full years. However, during the early 1990s the scarcity of heroin in the drug market prompted him to start injecting buprenorphine, known locally as Maal Shui, as a means of lessening the effects of heroin withdrawal.

Labu felt highly stressed and anxious about his dependence on drugs. Despite the fact that his knowledge of HIV and AIDS is satisfactory and he practices safe sex to prevent transmission, he shared needles once or twice a month. His anxiety worsened during the period when his family abandoned him. He said, “Everyone turned their face away from me—even my own children and grandchildren. No one but peers would speak to me.”

Naturally, Labu sought help and attempted detoxification on two occasions—unsuccessfully. He was finally referred to icddr,b’s OST programme by a self-help group and enrolled in the study in September 2010.

While participating in the OST programme, Labu opted for voluntary counselling and testing and, fortunately, results confirmed that he was not HIV-positive. Labu’s treatment in OST was smooth as he was motivated to free himself of drug dependence. He was administered 35 mg of Methadone and demonstrated consistent drug adherence. His urine test results for opiates were consistently negative and he rarely consumed benzodiazepines.

In October 2011, after 13 months of OST, Labu was able to stop this therapy safely. For the next four months, he returned on a weekly basis for a routine health check-up and urine test. He is now completely drug-free and is not experiencing withdrawal symptoms or cravings for drugs. His family and friends began to see positive changes in his behaviour during his treatment and have embraced him again.

* Not his real name
SURVEY REVEALS SIGNIFICANT REDUCTION IN TB PREVALENCE

Tuberculosis (TB) is a contagious bacterial infection that involves the lungs but may spread to other organs as well. In developing nations such as Bangladesh, TB remains a leading cause of morbidity and mortality. Each day, an estimated 875 new cases of TB occur, while 180 people die of this disease. However, around one-third of all cases are thought to go undetected, causing serious difficulties in treatment and controlling the diseases’ spread.

In 2011, the World Health Organization published the findings of a nationwide survey undertaken by icddr,b, which revealed a significant reduction in the overall prevalence of smear-positive TB cases in Bangladesh. The report provides the most accurate estimate of prevalence rates for smear-positive TB in Bangladesh to date and concludes that estimated rates of TB among Bangladeshis over 15 years of age have dropped significantly since the last national survey in 1987-1988. At present, the prevalence rate is 79.4 cases per 100,000 people compared 870 cases per 100,000 in 1988. The prevalence was higher among several groups: males, those without a formal education, the elderly, people of low socio-economic status and those living in rural communities. The report has significant policy implications supporting programmes focused on TB prevention in older populations, rural communities, and lower socioeconomic groups.

The survey was commissioned by WHO and funded by USAID and The Global Fund to Fight AIDS, TB and Malaria, in collaboration with the National TB Control Programme (NTP). Technical support was provided by the KNCV Tuberculosis Foundation, with additional support from BRAC, the Damien Foundation and other partners of the NTP.
NEW INSIGHTS INTO MALARIA PREVALENCE

Malaria is a parasitic disease that involves high fevers, shaking chills, flu-like symptoms and anaemia. In Bangladesh, it is a major public health concern. Of the country’s 64 districts, 13 are classified as high-risk malaria zones. According to the World Malaria Report 2010, an estimated 55,837 clinical cases were treated. Given that many cases remain undiagnosed in Bangladesh and therefore unreported, icddr,b has identified an acute need for more accurate data on malaria prevalence in Bangladesh.

In the past, research has been limited by geography: establishing the necessary infrastructure for research in remote malaria endemic regions is not easy. In late 2009 however, in collaboration with the Johns Hopkins Malaria Research Institute, icddr,b established a malaria surveillance project in the hill tribe region, located in southeastern Bangladesh.

The study benchmarked information relating to malaria prevalence, including vector surveillance, the level of public knowledge and awareness, health promotion practices, the use of bed nets and socioeconomic disparities. icddr,b’s research team also assessed existing malaria control strategies for potential shortcomings. Demographic data are now collected every four months from approximately 20,000 people, and community and clinical studies are run side-by-side, allowing for cross-fertilisation of learning. The initial demographic report of the site is available on icddr,b’s website.

In 2011, icddr,b shared—both nationally and at the 60th ASTMH meeting in Philadelphia, PA, USA—the preliminary findings of its three-year surveillance study. Key findings identified that incidences of malaria are highly clustered according to seasonal changes and location, that the majority of community infections are asymptomatic and that a significant number of malaria sufferers do not visit a hospital. The study exemplifies the benefit of disease surveillance and demonstrates that the existing national data, based on passive case detection, excludes the majority of infections and therefore underreports the burden of the disease.

The surveillance site established by icddr,b offers a sophisticated research context for future malaria studies in Asia that examine the epidemiology of malaria, evaluate malaria control strategies and pilot new anti-malarial drugs and vaccines. The study site has been granted full membership of the INDEPTH—an international network of health and demographic surveillance sites.
ADVISING THE ARMED FORCES
Bangladesh’s armed forces have a significant presence in the country’s malaria-prone areas. On icddr,b’s recommendation, an Army Medical Board reviewed and took the decision to adopt the National Guidelines for Malaria Treatment. Among the new changes, combination artemether/lumefantrine is now the first-line drug of choice in the treatment of malaria caused by the *P. Falciparum* parasite and rapid diagnostic tests have been introduced. It is expected that the National Malaria Management Guidelines will soon be adopted by the Bangladesh Navy and Air Forces, the Border Guards of Bangladesh and the Bangladesh Ansar (internal security force).

MALARIA SYMPOSIUM HELD
A symposium on malaria organised by icddr,b offered key players a platform to share their expertise and experiences regarding malaria in the region for the first time. Held during icddr,b’s ASCON XIII in March 2011, the symposium *Malaria Control in Bangladesh: Past, Present and New Opportunities* brought together key stakeholders from Bangladesh and international malaria experts who work in the region. The sessions were highly participatory and provided a context in which to share and discuss the preliminary findings from the study *Mapping Malaria Epidemiology in Bangladesh*.

MALARIA COMMISSION PRAISES ICDDR,B
For the first time in 28 years, a joint committee convened a meeting to review Bangladesh’s National Malaria Control Programme. The event included a presentation by icddr,b experts on their current malaria surveillance activities. The committee acknowledged the positive impact of icddr,b’s research and interventions on—not only the Bangladesh National Malaria Control Programme—but also policy in the entire Southeast Asia regional area.
ICDDR,B LABS CONFORM TO INTERNATIONAL STANDARDS
During 2011, icddr,b attained accreditation for 149 test services against the ISO 15189 standard. This included test procedures performed in clinical haematology, clinical biochemistry, clinical microbiology and clinical sero-diagnostics. The next round of accreditations focuses on nutritional biochemistry, virology, the blood bank and tuberculosis laboratories, which also fall under the scope of ISO 15189. These laboratories are expected to receive accreditation in mid-2012.

BIOSAFETY AND BIOSECURITY
icddr,b has operated Bangladesh’s first biosafety level (BSL 3) laboratory since August 2010 after receiving certification for 2010-2011. Since then, researchers have used the facility for research and confirmatory diagnosis of tuberculosis. In 2011, new researchers received regular training on how to use and conduct research inside the BSL 3 facility. Following the CDC/NIH guidelines, the BSL 3 laboratory was recertified for 2011-2012.

The BSL 3 laboratory has the capacity to support a broad range of activities requiring containment, such as for research on tuberculosis and virology as well as infectious disease outbreak investigation. The laboratory enables icddr,b to isolate biological agents that otherwise could not be safely studied in Bangladesh, including those responsible for multi-drug-resistant tuberculosis and avian influenza. The laboratory also enables icddr,b to assist the Government of Bangladesh and other institutions in South Asia with research into deadly diseases and also to ensure accurate diagnoses.

INAUGURATION OF BSL 3 LABORATORY
On 18 May 2011, then US Ambassador to Bangladesh, His Excellency James F. Moriarty officially inaugurated the biosafety level 3 lab on icddr,b’s Mohakhali campus. “icddr,b’s BSL 3 laboratory is a very good example of broad collaboration linking the US Department of Agriculture, the Centers for Disease Control and Prevention, the National Institutes of Health, the US Agency for International Development, the Bangladesh Ministry of Health and the Bangladesh Ministry of Finance,” he said.
BUILDING LABORATORY CAPACITY
Following the BSL 3 laboratory certification, icddr,b’s Biosafety Office hosted a workshop with the objectives of providing a roadmap to initiate a biosafety/biosecurity network in Bangladesh; providing hands-on training; demonstrating how to implement on-the-spot solutions by low-cost physical means; and creating collaborative opportunities across institutions and government ministries for researchers, technicians and students. One hundred and fifty five participants from 46 institutions took part in the workshop. Shortly afterwards, a more in-depth training was organised with approximately 100 participants. During 2011, training on how to maintain biosafety and biosecurity standards was also organised for icddr,b hospital and laboratory staff in Dhaka and at the Matlab Health Research Centre.

As part of extending support to build the capacity of other laboratories in Bangladesh, icddr,b’s biosafety experts, together with the BSL 3 laboratory certifiers from Biosafety Biosecurity International, USA, visited three laboratories at the Institute of Epidemiology and Disease Control and Research, the Bangladesh Livestock Research Institute and the Bangladesh Council of Scientific and Industrial Research.
More than 80% of women receiving icddr,b services at the Matlab field site, give birth in a facility. Nationally, 77% of women give birth at home, and of these only 4% are attended by a skilled birth attendant.
MATERNAL, NEWBORN & CHILD HEALTH

The health of mothers, their newborns and their children determines the health of a nation. icddr,b’s research in this area cuts across almost every one of our research centres. Collaboration among centres ensures that icddr,b develops and tests interventions across a wide range of interconnecting health challenges and reflects our commitment to improving health outcomes for women and children worldwide. The dissemination of research to, and close cooperation with, the Government of Bangladesh has led to national policy change and wide-scale adoption of many of our innovations. This has helped place Bangladesh among a handful of countries in the world on track for reaching the Millennium Development Goals aimed at reducing maternal and child death rates by 2015.

EVIDENCE-BASED POLICYMAKING IN REPRODUCTIVE HEALTH

Research should not take place in isolation. Rather icddr,b strives to inform policymaking and improve health outcomes for the maximum number of people. A concerted effort is being made to improve the communications skills of researchers at all levels and to increase their awareness and understanding of policymaking. In 2011, grant funding from the Maternal Health Task Force enabled scientists at icddr,b to learn how to communicate their findings to policy-makers in a more effective way. In this project, icddr,b developed and provided a training course on knowledge translation to reproductive health researchers who produced a series of Knowledge Translations Briefs covering a variety of issues. As part of our ongoing commitment to ensure better access to evidence, these are now available on the icddr,b website (icddrb.org/CRH_knowledge_translation_briefs).

At the same time, the briefs were posted, icddr,b delivered specialised training on the Use of Research Evidence for the Health Policy Making Process in Bangladesh for Government of Bangladesh policymakers and planners. The programme was part of a WHO Alliance/Wellcome Trust-funded effort to strengthen evidence-based policymaking for reproductive health in Bangladesh. icddr,b also worked with the Government of Bangladesh to launch the Research Policy Communication Cell (RPCC) within the Directorate General of Health Services. This is one important outcome of icddr,b’s project to enhance capacity in applying evidence-based research on policy making for reproductive health. This RPCC will foster networking and improve ongoing exchange of information between researchers and policy makers.
SAVING LIVES WITH LOW-COST INTERVENTIONS
Published in May 2011, the study Scaling up of Misoprostol for Prevention of Postpartum Haemorrhage in 29 Upazillas of Bangladesh provides evidence for an effective approach to save women from the leading cause of maternal death—postpartum haemorrhaging (PPH)—which kills over 500,000 women each year globally. The study evaluated the effectiveness of education for trained birth attendants on the use of an icddr,b-developed mat to measure PPH and the use of Misoprostol to prevent PPH. The study results showed 37 fewer maternal deaths per 1,000 when using this approach as compared to the national average, and illustrate how an easy-to-use technology combined with education can save mothers’ lives in a low resource setting.

In 2011, associate scientist, Dr. Abdul Quaiyum, enhanced his innovation by developing a biodegradable version of the ‘icddr,b PPH mat’ with funding from a Bill & Melinda Gates Foundation Grand Challenge grant. Based on research findings, icddr,b is working towards scaling up distribution of its modified Clean Delivery Kits, which include the icddr,b mat and Misoprostol, and will be testing the biodegradable version of the mat at scale first in Bangladesh and subsequently in countries within sub-Saharan Africa.

NEW STUDY ASSESSES IMPACT OF HOME-BASED FOOD FORTIFICATION
Evaluating the effectiveness of low cost interventions to address significant public health issues is a key attribute of icddr,b research. In 2011, icddr,b launched a study with the University of California, Davis, to assess the effectiveness of home-based food fortification approaches for the prevention of under-nutrition in pregnant and lactating women and their children. More than 3,000 mothers in northwest Bangladesh are participating in the Rang-Din nutrition effectiveness study. Full findings of the study are anticipated in 2015.

MANOSHI PROJECT COMES TO AN END
The five-year Manoshi maternal, newborn and child health programme concluded in 2011. Implemented by BRAC with technical assistance from icddr,b and funding from the Bill & Melinda Gates Foundation, Manoshi established a community-based health programme targeted at reducing maternal, newborn and child mortality in the urban slums of Bangladesh. The combination of an absence of appropriate health services and the growth of urban slums—where 60% of the country’s population is expected to live by 2030—make this population particularly important for study. icddr,b chaired the technical assistance committee that reviewed research topics, objectives, design, sampling, tools, operations and timeline. icddr,b researchers also carried out a range of operations and evaluation research. Results have been used both in improving the programme and to scaling it up in other slum settings.

Dr. Laura Reichenbach, Reproductive Health Director, discusses patient cases with staff at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital
In February 2011, the Government of Bangladesh released the preliminary results of the Bangladesh Maternal Mortality Survey (BMMS), conducted in 2010 with significant technical assistance from icddr,b. Among the survey’s most startling findings was that Bangladesh’s maternal mortality ratio had dropped by 40%, from 322 deaths per 100,000 live births in 2001 to 194 in 2010. icddr,b’s ongoing collaboration with government has led to wide-scale adoption of many innovations and practices developed through its research and has helped put the country on track to achieve Millennium Development Goal 5.

Conducted using a nationally representative sample of 175,000 households, the survey found an increasing number of babies being born in health facilities; from 9% in 2001 to 23% in 2010. (This compares with more than 70% at Matlab where community health workers have been working for over 30 years to increase the number of facility births.) The treatment of maternal complications in health facilities also rose from 16 to 29% in the same period. These important shifts reflect increased access to care, higher levels of education among women, greater awareness of available and vital healthcare services and improved economic conditions. In addition, the decline from 3.2 children per family in 2001 to 2.5 in 2010 has reduced the number of high-risk parity births. General fatality rates among women in most reproductive age groups have dropped significantly, along with the number of deaths from material causes, infections, circulatory conditions and even suicides.

Though the causes of direct obstetric deaths have been substantially reduced, haemorrhage and eclampsia are together responsible for more than half of all maternal deaths. The need to strengthen access to relevant treatment, implement universal healthcare, improve the system and quality of referrals and scale up the use of icddr,b’s modified Clean Birth Kit will go a long way towards achieving MDG 5.
Infections are the leading cause of death among newborn babies in developing countries

UNDERSTANDING THE CAUSES OF NEONATAL INFECTION IN SOUTH ASIA

Infections are the leading cause of death among newborn babies in developing countries, yet surprisingly little is known about which bacteria and viruses cause these infections. In an attempt to fill this knowledge gap, icddr,b experts in child, adolescent and reproductive health are collaborating on the ambitious Aetiology of Neonatal Infection in South Asia (ANISA) project, which began its field activities in 2011.

Encompassing both urban and rural communities in Bangladesh, India and Pakistan, ANISA is using state-of-the-art molecular techniques, as well as more conventional blood culture sampling methods. These will provide population-based estimates of the aetiology of neonatal infections, as well as the risk factors, predictors and antibiotic susceptibility.

ANISA is funded by the Bill & Melinda Gates Foundation and headed by Professor Samir K. Saha with his team at the Child Health Research Foundation based in the Dhaka Shishu Hospital. Since launching the study in 2010, icddr,b scientists have collaborated closely with the Child Health Research Foundation to design and implement ANISA, as well as to develop innovative methods for data collection, monitoring and specimen tracking. icddr,b is also involved in community surveillance in Sylhet in the northeast of Bangladesh.

The project is now providing a platform for an additional component on maternal infection surveillance. Key preliminary findings will be released on an ongoing basis.
SURVEY FINDS HEALTH SERVICES NOT YOUTH-FRIENDLY

NGOs and government departments routinely draw on the rigorous evaluation skills and expertise of icddr,b researchers. In 2005, with funding assistance from The Global Fund, 200 health service delivery points in the public, NGO and private sectors were tailored to provide services to young people. In 2011, icddr,b scientists, supported by the World Health Organization Dhaka Office, undertook the first-ever study to assess the quality and coverage of these services. Visiting a quarter of all existing youth-friendly health service (YFHS) facilities, together with 44 comparison facilities, icddr,b researchers interviewed young people aged 15-24 years living within a kilometre of each facility. They also interviewed clinical staff and conducted direct observations of service standards.

The findings were disseminated to adolescent health programme managers during a regional workshop held in Bangkok, Thailand, in November 2011. The findings revealed that, while the YFHS came closer to meeting national standards than the comparison facilities, the difference in quality was not significant, with differences ranging from 2 to 19% points in different quality standards. The findings also showed that the YFHS initiative had made ‘some’ difference in the quality of services provided by more sophisticated facilities, such as district hospitals; maternal, child and welfare centres; and upazila health complexes. However, it had made ‘no’ difference when compared with services provided by lower-level facilities, such as pharmacies and health and family welfare centres. The YFHS coverage also was found to be disappointingly low, with only a quarter of youths interviewed being aware of local YFHS facilities.

These findings suggest that, for this to succeed, the YFHS programme must be strengthened in a number of areas. These include boosting behaviour-change activities by informing youths, as well as adults, about the availability of YFHS services. In addition, an accurate record-keeping system would enable the generation of disaggregated data on age and gender, which could, in turn, be used to monitor the programme's impact.

EXPERTS COLLABORATE TO IMPROVE CHILD HEALTH

Despite a substantial reduction in the under-five mortality rate in Bangladesh, neonatal deaths remain a challenge, and their contribution to overall under-five mortality is increasing. Most deaths among newborns occur within the first few weeks of life. In 2011, working in collaboration with the Government of Bangladesh, UNICEF and other partners, icddr,b’s child health experts have contributed in developing standard operating procedures for newborn care services at primary and secondary-level hospitals. These procedures, in line with WHO guidelines and approved by the Ministry of Health and Family Welfare, also are intended to help managers and service providers obtain the necessary infrastructure, equipment, logistics and skills for treatment.

A national scale-up plan has been developed to train government community-based health workers in the management of common childhood illness and newborns, using a Basic Health Worker package that was developed and adapted by icddr,b scientists based on tools developed by WHO. In addition, icddr,b, in collaboration with a local NGO and with the support from UNICEF, trained 1,500 community health workers in the community case management of pneumonia, diarrhoea, other illnesses and the sick newborn.

Based on knowledge gained from the previous programme manager’s course on child, icddr,b has developed and adapted an expanded package for programme managers to further improve maternal, newborn and child healthcare. This package will be used by sub-district- and district-level programme managers of the Directorate General of Health Services and the Directorate General of Family Planning. Field-testing of this combined package is now completed, and icddr,b scientists await feedback from WHO headquarters and its South East Asia regional office.
MANAGING SEVERE PNEUMONIA AND SEVERE ACUTE MALNUTRITION

In 2011, icddr,b and the Dhaka-based Radda Maternal and Child Health Family Planning Centre undertook collaborative research to compare the management of severe pneumonia and SAM in a hospital and a daycare clinic. Radda’s daycare centre in Mirpur in the northwest of Dhaka is equipped with oxygen, suction, pulse oximetry, nebulisers and glucometers. Researchers randomly selected patients aged from 2-5 years of age with severe pneumonia and SAM for treatment at Radda’s daycare clinic or a hospital. Children attended the daycare clinic for daily antibiotics, dietary supplements, micronutrients and oxygen therapy if necessary. Other children stayed in hospital overnight and received identical treatment. All patients involved in the study were discharged once their condition improved, but returned for follow-ups.

The study’s findings reveal that community-based treatment at daycare facilities can be as safe and effective as hospital-administered treatment. This has important implications for the management of severe pneumonia and SAM worldwide.
In the Nutrition Rehabilitation Unit of icddr,b’s Dhaka Hospital, implementation of a standardised treatment protocol for severely malnourished children has reduced mortality by more than 75%.
Globally, malnutrition contributes to the deaths of between 3.5 and 5 million children under the age of 5 each year.

BUILDING NATIONAL AND REGIONAL CAPACITY TO FIGHT SEVERE ACUTE MALNUTRITION

Severe acute malnutrition (SAM) is caused by a deficiency of protein, vitamins and minerals, which results in the loss of body fat and muscle strength and requires urgent medical treatment. In Bangladesh, a lack of knowledge and resources, and of trained community physicians and public health personnel, are major obstacles to tackling SAM. Many children suffering from the condition die unnecessarily while undergoing treatment. This is a direct result of poorly-trained health personnel unable to distinguish between practices that are appropriate for well-nourished children, but can be fatal for a child suffering from SAM.

In 2011, icddr,b’s nutrition experts assisted the Government of Bangladesh in developing much-needed national guidelines for the management of SAM. They also collaborated with the Government’s Institute of Public Health and Nutrition to arrange two, five-day teaching sessions for trainers involved in treating SAM. This initiative complemented a variety of public efforts to boost the level of assistance given to malnourished children and mothers.

SAM is not just a problem in Bangladesh; it is prevalent across South and Southeast Asia. To share icddr,b’s expertise, our scientists regularly work with governments in the region and conduct training in clinical management of SAM. In 2011, our nutrition team helped to revise Afghanistan’s national SAM guidelines, in addition to jointly formulating regional guidelines on SAM management in the Maldives and Sri Lanka as well as Southeast Asian countries including Myanmar, Timor-Leste and Thailand.

ICDDR,B HOSTS REGIONAL MALNUTRITION CONFERENCE

In June 2011, icddr,b’s nutrition team hosted a regional conference on the management of acute malnutrition in collaboration with WHO, UNICEF and the World Food Programme. The conference convened public health professionals and government officials from South and Southeast Asia to exchange ideas and expertise on how to treat acute malnutrition at the hospital and community level. Participants from countries, including India, Thailand, Bhutan, Nepal and Sri Lanka—some of which have persistently high rates of malnutrition despite economic growth—attended the conference with the ultimate objective of decreasing child mortality in their countries. Bangladesh’s Minister of Foreign Affairs Dr. Dipu Moni, a public health champion who studied at the Johns Hopkins Bloomberg School of Public Health, inaugurated the conference.

MYANMAR REQUESTS EXPERT ASSISTANCE

icddr,b’s vast expertise in treating childhood malnutrition throughout the region was called upon at the end of 2011. Food insecurity in certain regions of Myanmar, along with a widespread burden of acute malnutrition, led its Ministry of Health to issue a call for assistance to icddr,b via the World Health Organization. On 3 December 2011, a three-member icddr,b team embarked on a week-long visit to Myanmar with the aim of strengthening knowledge and practices among their senior health professionals. Training workshops addressed issues such as rising national malnutrition rates, particularly among children.
MALNUTRITION AND ENTERIC DISEASE: THE CONSEQUENCES

icddr,b is a key partner in a study of the relationship between childhood malnutrition and intestinal infections. The study is titled *Aetiology, Risk Factors and Interactions of Enteric Infections and Malnutrition and the Consequences for Child Health and Development* (MAL-ED) and is funded by the Bill & Melinda Gates Foundation, with oversight from the Fogarty International Center at the US National Institutes of Health.

The study tests two related hypotheses: (1) that enteric infections lead to malnutrition by causing intestinal malabsorption and/or by altering the barrier and absorptive functions of the gut, and (2) that the combination of enteric infections and malnutrition results in growth and cognitive impairments in young children.

icddr,b and the other partners are conducting epidemiological studies—longitudinal and case-control—and providing a framework for resources, data and samples for its companion study, *Biomarkers of Malnutrition in Children*. The MAL-ED investigators selected eight sites—all in countries with a high enteric infectious disease burden—including Bangladesh.

icddr,b’s research is taking place in the slums of Mirpur, a suburb of Dhaka where the prevalence of anaemia is high. Preliminary results indicate that nutritional supplements recommended by a former National Nutrition Programme—a home-fortified midday meal containing iron micronutrients—fails to achieve optimal growth among malnourished children over the course of the stipulated two-month period.

MAL-ED will also offer insights into the genetic basis of malnutrition—that is, why some children fail to recover following treatment. The genetic architecture of the host renders some children more susceptible to malnutrition, either by limiting an ability to maximise nutrients or by impairing interactions with the gut microbiome. Significantly, the study has already identified three genes with the potential to protect children from malnutrition.

Ultimately, the research of icddr,b and the other participating research entities will improve understanding regarding the complex factors affecting malnutrition and lead to more targeted, cost-effective interventions and a reduction of the disease burden of those living in poverty.
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**AUSTRALIA**

- Australian Agency for International Development
- CSIRO Human Nutrition, Kintore Avenue, Adelaide
- La Trobe University, Melbourne
- Nossal Institute Limited
- The University of Melbourne
- University of New England
- University of Queensland
- University of Sydney
CHRONIC DISEASES

Bangladesh, like many other developing countries, is facing a rapid epidemiological transition—from communicable diseases, such as diarrhoea and pneumonia, to chronic ones, such as diabetes and heart disease. icddr,b continues to take a national lead on understanding, and trying to manage, this largely hidden epidemic. icddr,b’s work in this area is conducted through its Centre for Control of Chronic Diseases, which is one of the world’s 11 centres under the collaborating network of the UnitedHealth Group and NIH’s National Heart Lung and Blood Institutes, USA.

TOWARDS CONTROLLING BANGLADESH’S CHRONIC DISEASE BURDEN

Understanding the burden of chronic disease in low-income countries is vital to planning future healthcare needs. In Bangladesh, icddr,b is taking the lead on collecting the data necessary to assess the magnitude of the chronic disease epidemic and to provide a valuable guide for developing new policies to address the chronic disease burden. These include how to effectively diagnose, screen and intervene in both urban and rural primary care settings and how to identify risk factors. During 2011, every field project became fully operational, and a number of projects were completed. The scope of research areas expanded to include chronic obstructive pulmonary disease, hypertension, diabetes and asthma.

STUDYING CHRONIC OBSTRUCTIVE PULMONARY DISEASE

icddr,b’s study on chronic obstructive pulmonary disease (COPD) covered both rural and urban populations in Bangladesh. Lung function assessments were conducted by spirometry in a community setting, which included 3,297 participants out of a possible 3,791. The community assessment identified people with suspected cases of COPD, who were subsequently invited to field site clinics. A reversibility test involving 555 suspected cases was undertaken to confirm COPD cases. Spirometry and reversibility tests are now completed at the icddr,b Kamalapur field site, while progress is ongoing at our Matlab Health Research Centre. Data entry is on schedule. An educational intervention for COPD cases has been developed and finalised.

RISK FACTORS FOR ARTERIAL HYPERTENSION

Data were collected for a population-based study on the prevalence of arterial hypertension and its risk factors and management among adults aged 20 years or older in rural and urban Bangladesh. Management of baseline (for 1678 individuals) and first follow-up (for 403 primary suspected hypertensive cases) of the study is complete in both urban and rural areas. Data analysis and manuscript writing are currently underway. An educational intervention for hypertensive and pre-hypertensive cases has been developed and the analysis is being finalised.

PREVALENCE OF CHILDHOOD ASTHMA

A community-based study is currently underway at icddr,b field sites in Kamalapur and Matlab to detect the prevalence and determinants of asthma among children in Bangladesh’s rural and urban areas. Nine hundred and sixty participants enrolled in 2011 and the first round of follow-ups is complete. Guardians of children with suspected cases of asthma have been reminded to contact icddr,b if an acute exacerbation occurs. Data entry and reversibility tests are currently in progress.
A participant in the study of chronic obstructive pulmonary disease blows into a spirometer, which is used to assess lung function.
BUILDING A NATIONAL PLATFORM
In December 2011, icddr,b’s Centre for Control of Chronic Diseases and its technical advisory group members held an event to promote the creation of an expanded national platform on non-communicable diseases. Participants included high-profile chronic disease experts in Bangladesh, non-governmental organisations and donor agencies. Representatives from the Government of Bangladesh and the national offices of the National Heart Foundation and WHO also participated.

BUILDING CAPACITY AMONG JUNIOR RESEARCHERS
The Centre for Control of Chronic Diseases continues to develop the science-writing skills of its junior researchers. This is done through monthly manuscript rounds, working to overcome barriers that may prevent them from submitting manuscripts to a wider range of publications. 2011 also saw the second batch of students graduate from the Master’s in Public Health-Plus programme, for which the Centre for Control of Chronic Diseases designed a programme. International and national supervisors facilitated the courses and provided extensive hands-on training. The programme aims to produce a critical mass of MPH graduates with an advanced knowledge of chronic diseases and the skills necessary to design and undertake research in this specialised area.

Six MPH graduates from the James P. Grant School of Public Health participated in this Centre for Control of Chronic Diseases’ programme, which was organised in collaboration with the James P. Grant School of Public Health and the UK’s Institute of Development Studies. Numerous graduates and junior researchers are currently involved in survey activities and field research, and it is likely that several participants will build successful careers in research by completing further advanced post-graduate training.

PROMOTING EXERCISE
To create awareness of the benefits of physical activity in preventing chronic diseases, icddr,b observed World Physical Activity Day on 6 April 2011 in line with the Brazil-based Agita Mundo Network. icddr,b staff took part in a lively exercise session and a colourful rally.

Chronic diseases are now responsible for 60% of all deaths in Bangladesh.*
icddr,b’s Equity and Health Systems research centre aims to generate knowledge and evidence-based solutions to improve health outcomes, focusing on the health and well-being of the disadvantaged. It utilises research and partnerships to generate knowledge, improve equity and transform health systems into being more effective, equitable and accountable. Recently, the centre has conducted capacity-building activities and training on systematic reviews in Bangladesh, India, Nepal and Afghanistan.

**WORKING TOWARDS UNIVERSAL HEALTH COVERAGE**
icddr,b is committed to the development of health systems that are equitable, effective and accountable. In Chakaria, in the southeastern corner of Bangladesh, icddr,b scientists are building a community health model intended to reduce the financial burden on the poor, and provide access to necessary health services for all, without risk of financial hardship or ruin.

The innovative model, which is being piloted through the Chakaria Community Health Project, will address the needs of low-income groups to access healthcare by introducing a pre-payment scheme and raising general health awareness among local residents.

In December 2011, community members attended an icddr,b-sponsored, awareness-raising health fair. The event featured a play depicting how health problems can quickly escalate and a community discussion on how the healthcare model will introduce its pre-payment scheme. This will be the first programme of its kind in Bangladesh and a potential model for other low- and middle-income countries.

Earlier in 2011, the Rockefeller Foundation inaugurated the Centre of Excellence for Universal Health Coverage at the James P. Grant School of Public Health (JPGSPH). This centre, made possible by funding from the foundation, has helped icddr,b produce evidence-based policy for actionable universal healthcare coverage.

**RECOGNITION OF ICDDR,B’S ROLE**
icddr,b’s work in universal health coverage was recognised by the 2011 Bangladesh Health Watch report, which praised icddr,b’s attempts to meet the nation’s healthcare challenges. “The report is spot on in pointing out that the poor have to spend a disproportionately large amount of their income on health costs, and that is exactly what we are trying to address in Chakaria,” explained icddr,b’s Deputy Executive Director Dr. Abbas Bhuiya who leads the Chakaria research project. “The universal health coverage model we are developing, which could be applied across the country, attempts to address local health problems and create a medical and financial buffer against natural calamities.”

**PUTTING UNIVERSAL HEALTH COVERAGE ON THE AGENDA**
icddr,b’s 13th Annual Scientific Conference (ASCON XIII), a three-day event held in Dhaka in March 2011, addressed *Science to Accelerate Universal Health Coverage* as its central theme. The event attracted 800 scientists, health professionals, programme managers, community organisers, and policy-makers from around the world.
Women’s roles in Bangladesh are fast changing with more opportunities for higher education and employment. However, vulnerabilities to sexual abuse and violence within and beyond the home continue to hinder their social and economic development.
icddr,b recognises that gender is one of the most important determinants of health and its scientists have studied gender-related issues for over 20 years. Research areas now include the relationship between gender and reproductive health; gender and nutrition; gender and development; gender, sexuality and HIV/AIDS; and violence against women—a particular focus in 2011.

In urban slums, young women and girls are particularly vulnerable to the denial of their sexual and reproductive health rights and gender-based violence. In March 2011, icddr,b and partner organisations formed a consortium to launch an action research project aimed at reducing the violence suffered by women and girls living in Dhaka’s slums by addressing the denial of their sexual and reproductive health rights.

Funded by the Embassy of the Kingdom of the Netherlands, the SAFE (Growing Up Safe and Healthy) project has assembled a strong network of legal service providers, reproductive and sexual healthcare providers, human rights advocates, women’s rights advocates and research organisations. These include the Bangladesh Legal Aid and Services Trust (BLAST), Marie Stopes Clinic Society, Nari Maitree (We Can Campaign) and the Population Council.

Over the next three years, the project will address violence against woman and girls and combine research, intervention, advocacy and lobbying to raise awareness of sexual and reproductive health rights among adolescent girls and young women living in urban slums, as well as providing them with enhanced access to healthcare and legal services.

INVESTIGATING PATTERNS OF VIOLENCE AGAINST WOMEN

Preliminary findings of an icddr,b study, released in December 2011, showed that Bangladeshi men who have preconceived negative attitudes towards women are more likely to use violence against them and their surrounding community members.

Data collected from 1,254 men in urban sites and 1,146 men in rural sites in Bangladesh found that men almost universally supported at least one gender-inequitable statement. Between 20% and 29% of men supported several gender-inequitable statements. The survey further revealed that men with gender-inequitable attitudes are significantly more likely to have perpetrated physical and/or sexual violence against their female partners. Also, men abused in their childhood are twice as likely to be violent against women later in life.

icddr,b carried out the study as part of the Change Project, coordinated by Partners for Prevention and funded by UNFPA Bangladesh. It was the first of its kind conducted in the country to better understand men’s attitudes and practices regarding gender and violence against women.
In 2011, icddr,b researches and scientists contributed to 288 international publications. These contributions included 205 original papers, 29 book chapters/monographs, 3 Cochrane Database Systematic Reviews and 51 letters/editorials.

International publications carrying icddr,b’s work in 2011 included:

- BMJ 2011 (2 articles)
- Lancet Infectious Diseases 2011 (3 articles)
- Cochrane Database Systematic Reviews 2011 (3 protocols)
- PLoS Neglected Tropical Diseases (9 articles)
- Journal of Infectious Diseases 2011 (5 articles)
- PLoS One 2011 (10 articles)
- Vaccine 2011 (4 articles)
- American Journal of Tropical Medicine & Hygiene 2011 (11 articles)
- Infection Ecology & Epidemiology 2011 (1 article)
- Food & Nutrition Bulletin 2011 (2 articles)
- Health Research Policy & Systems 2011 (1 article)
- Journal of Tropical Pediatrics 2011 (2 articles)
- Health Policy Plan 2011 (2 articles)
icddr,b offers training programmes in Bangladesh, but is often called upon by other governments and organisations to provide technical assistance and training. The training offered by icddr,b is as broad as our research agenda. We firmly believe that, for research to benefit communities, knowledge must be shared with other researchers, health professionals and policymakers. Each of these plays a vital role in improving public health; speeding progress and limiting duplication of research effort, incorporating latest evidence into daily practice and creating the policy framework needed to support research evidence. Together they can improve responses to new and emerging issues in public health.
icddr,b’s training programmes, aimed at increasing capacity to conduct research in developing countries, are world renowned. Our courses build the skills necessary to manage programmes for the control of diarrhoeal diseases; to manage family planning services; to improve the clinical skills of health personnel through ‘hands on’ training on specific aspects of diarrhoeal diseases, associated complications and nutritional problems; and to improve responses to new and emerging issues in health and population.

In 2011, 1865 individuals (trainees, students, fellows and interns) from 26 countries, including Bangladesh participated in icddr,b training and education activities. Countries represented were Australia, Canada, Denmark, France, India, Germany, Japan, Jamaica, Korea, Mozambique, Nepal, Netherlands, New Zealand, Norway, Portugal, Qatar, Spain, Turkey, Thailand, South Africa, Sweden, Thailand, UK, USA, the United Arab Emirates and Vietnam.

Of the 283 international participants, 20 were students from the James P. Grant School of Public Health at BRAC University, 29 were regional workshop participants who attended the Management of Acute and Severe Malnutrition course (sponsored by WHO, WFP, UNICEF, and icddr,b), and 17 were students from the Masters programme at Uppsala University, Sweden. The remaining 156 were overseas students in the Field Experience Programme from 54 institutions/universities around the globe.

Since 1978, over 30,000 health professionals from over 70 countries have benefitted from icddr,b’s technical training.
THE GROWTH AND TRANSFER OF THE FIELD EXPERIENCE PROGRAMME
The Field Experience Programme was revitalised in 2009, with updated policies, application forms and new tools, including a computerised student database for monitoring and evaluation. Throughout 2011, the programme moved from the Technical Training Unit to a Student Services Unit within Human Resources, which will manage the diversified opportunities on public health practicum, masters or doctoral dissertations for the students at home and abroad.

SCHOOL OF PUBLIC HEALTH APPOINTS ICDDR,B STAFF AS FULL PROFESSORS
Established in 2004, the James P. Grant School of Public Health at BRAC University collaborates closely with icddr,b—a key partner in most of its training programmes, including its flagship Masters in Public Health (MPH). In December 2011, BRAC University honoured 11 newly appointed professors and associate professors, including nine icddr,b staff members who have been working as adjunct professors in the school since its founding. Along with icddr,b’s Executive Director Dr. Alejandro Cravioto, the school appointed other icddr,b scientists as professors, including Dr. Abbas Bhuiya, Dr. Stephen P. Luby, Dr. Shams El Arifeen, Dr. Tahmeed Ahmed and Dr. Alayne M. Adams. Dr. Quamrun Nahar and Dr. Jahangir A.M. Khan were recognised as associate professors, and Dr. Kazi Mizanur Rahman was appointed assistant professor. A total of 20 icddr,b staff members serve on the school’s faculty.

NATIONAL CAPACITY BUILDING
Collaboration with the James P. Grant School of Public Health and the Ministry of Health and Family Welfare has been extremely important in building the capacity of the local health workforce through short training courses. Of equal importance has been icddr,b’s contribution to building the capacity of health managers and leaders in the public sector to combat outbreaks of cholera, other diarrhoeal diseases and malnutrition. Globally, collaborations with universities such as Uppsala University in Sweden, as well as UN agencies, have complemented icddr,b’s expertise in health worker training.

GOING BACK TO THEIR ROOTS
icddr,b researchers and scientists never miss an opportunity to return to their academic roots to share their knowledge and expertise. There is a natural opportunity for productive collaboration between the communicable diseases research centre and Rajshahi University, the largest university in northern Bangladesh, as four of the six members of the centre’s Statistical Unit are alumni of this university.
CHOLERA WARRIORS TRAVEL TO WAR-TORN SOMALIA

According to UNICEF estimates, during 2011, almost five million people in famine-stricken southern Somalia were at risk for cholera and other causes of acute watery diarrhoea (AWD) due to malnutrition, lack of access to clean water, poor sanitation and hygiene, population movements and crowding in displaced sites. Years of civil war in Somalia had left the health infrastructure in shambles, complicating an effective response to diarrhoea outbreaks.

In response to a UNICEF request, icddr,b dispatched a team of experts from its Dhaka Hospital to provide technical expertise on managing large-scale cholera and AWD outbreaks in the region. The three-member team, composed of two physicians and a nursing officer, departed Dhaka on 1 September for the Somali refugee camps that have sprung up along the border with Kenya. During their deployment, the team trained local clinicians and equipped regional health authorities with the skills and knowledge necessary to manage and curtail serious cholera outbreaks to which the region is prone.

On 11 September, the team travelled to Somalia’s capital, Mogadishu, to conduct a 10-day training programme. The team was based at the Banadir Hospital, one of the only remaining referral hospitals in the city. Working in collaboration with Muslim Aid, Dr. Azharul Islam Khan, Dr P. K. Bardhan and nursing officer Momtaz Begum shared their expertise in the treatment of cholera and other causes of AWD with local healthcare workers and NGOs. The team also visited various relief organisations, such as Islamic Aid, UNICEF and Muslim Relief, to share expertise and discuss opportunities for future collaboration.

The team capped off its emergency and capacity-building mission by visiting a camp for internally displaced people. Where malnutrition and poor hygiene is rampant, icddr,b’s exchange of best practices with camp leaders and volunteer health workers have made a significant difference.

In recognition of icddr,b’s excellence in cholera treatment, the Conrad N. Hilton Foundation has awarded AmeriCares and icddr,b a grant to pilot a Global Cholera Preparedness initiative in the Horn of Africa. The two organisations will fulfil the work in 2012, building a long-term demonstration cholera treatment centre in Mogadishu and providing additional technical assistance.

BUILDING CAPACITY IN BEIRUT

icddr,b’s Head of Environmental Microbiology Dr. Sirajul Islam and Dhaka Hospital’s Chief Physician Dr. P.K. Bardhan were invited to facilitate a course organised by WHO on the Control of Cholera and Other Epidemic-prone Diarrhoeal Diseases in Humanitarian Emergencies held in the American University of Beirut in late September 2011. The course covered topics such as the laboratory aspects of diarrhoeal diseases—mainly cholera; causative agents of diarrhoeal diseases; collection, transportation and preservation of samples; isolation and identification of diarrhoea-causing agents; rapid diagnosis; importance of laboratory diagnosis in emergency situations like epidemics; and aspects of clinical management of diarrhoeal diseases.
The Dhaka Hospital Special Care Unit provides specialised personnel and resources to care for critically ill infants, children and adults.

icddr,b’s research is uniquely informed by its clinical services. The hospitals and treatment centres in Dhaka, Mirpur and Matlab continue to set standards in best practice, showcasing what can be achieved and raising the bar for practitioners in low-resource settings. They also reflect icddr,b’s multidisciplinary approach to research where clinicians, demographers, social scientists and virologists work together, with each bringing a different perspective and set of experiences to tackle pressing health issues. Consistent with icddr,b’s philosophy of providing health solutions for the most vulnerable populations, medical care is offered free to those in need.
DHAKA HOSPITAL AND MIRPUR TREATMENT CENTRE

During 2011, icddr,b’s Dhaka Hospital received a total of 128,330 patients. Most of the patients admitted were in the 0-5 age group (63,604)—the highest number of patients being admitted in the month of April (13,856). The Mirpur Treatment Centre saw the highest number of admissions during the months of May and June, with 1,719 and 1,723 patients respectively. The highest number of patients belonged to the 15+ age group (7,431). Rotavirus continued to emerge as the main pathogen causing diarrhoea in children, with both increased numbers during the peak (winter season) and persistence into the summer months. A continuing increase in patients attending the Mirpur Treatment Centre also relieved pressure on the Dhaka Hospital, with more severely dehydrated patients from Mirpur being treated in Mirpur than Dhaka—reducing the chance of deaths en route.

FIRST CLINICAL FELLOW TO COMPLETE FCPS

Dr. Lubaba Shahrin, a medical officer at icddr,b, has received her Fellowship of the College of Physicians and Surgeons (FCPS) degree in paediatrics. Dr. Shahrin joined icddr,b’s Dhaka Hospital as a Clinical Fellow in 2006 and is the first person from the fellowship programme to complete the highest postgraduate clinical degree given by the Bangladesh College of Physicians and Surgeons.
A nurse in the Dhaka Hospital uses a personal digital assistant (PDA) to collect patient records.
A healthcare worker in the maternity ward of Matlab Hospital cares for a newborn baby.
icddr,b’s Matlab Hospital provides two types of services: (1) maternal and child health and family planning (MCF-FP) and (2) diarrhoeal disease management. During 2011, a total of 18,794 women and children received outpatient treatment, with 5,368 women receiving maternity care and 3,771 children receiving treatment for acute respiratory infections. A total of 3,407 women and children were admitted for inpatient care, which included 2,295 pregnant mothers, 580 children suffering from pneumonia and 480 children for general treatment. Admissions for diarrhoea at the Matlab Hospital during 2011 totalled 18,845, with 1,325 patients coming from within icddr,b’s Health and Demographic Surveillance System.

MATLAB HOSPITAL EMBRACES NEW TECHNOLOGY

In 2011, the obstetrics unit of Matlab Health Research Centre was the latest icddr,b facility to adopt the SHEBA hospital management computing system. With this technology, Matlab Hospital became the first hospital in rural Bangladesh to go completely paperless. Now, information can flow freely throughout the hospital system by way of electronic devices, such as the PDAs and computers that are made available to staff and researchers.

icddr,b has been at the forefront of using technology to manage information flow both within the Dhaka Hospital in Mohakhali and at the Matlab Health Research Centre. In 2008, icddr,b’s Dhaka Hospital adopted a paperless management system—the first in Bangladesh—when it introduced SHEBA to better handle information flow within the hospital. Soon after, icddr,b extended these services to Matlab.

The paperless platform makes the data immediately available for research and clinical audit and improves patient care. As an example, recent data analysis led to a reduction in time to review by a physician to 30 minutes—an important reduction for patients with dehydration and one that is enviable by any global standard.
NEW PARTNERSHIP WITH AMERICARES AND MEDSHARE

During the 2011 Clinton Global Initiative meeting in New York, USA, icddr,b and its partners AmeriCares and MedShare announced a commitment to strengthening the health system in Bangladesh. They aim to do this by improving the quality of care in 12 hospitals through training and contributing key medical supplies and equipment. The commitment includes the distribution of nearly US$8 million worth of donated medical supplies and equipment, from which icddr,b will receive US$2 million worth of supplies that provide budget relief. Over a three-year period, icddr,b will operate and manage the project by training more than 7,600 Bangladeshi doctors, nurses and healthcare workers and benefiting an estimated 5.4 million patients with an improved standard of care. This expands on icddr,b’s successful experience establishing the first and only clinical governance programme in Bangladesh.

HILTON FOUNDATION PLEDGES SUPPORT

In November 2011, the Conrad N. Hilton Foundation awarded AmeriCares and icddr,b US$250,000 to prepare for and respond to outbreaks of cholera and other causes of acute watery diarrhoea. The Hilton grant provides funding to pilot the initiative in the Horn of Africa with the creation of a demonstration cholera treatment centre at one of the main referral hospitals in Somalia, training for clinicians in several refugee camps on the border with Kenya, and support for icddr,b’s clinical staff to provide their technical expertise.
Some of the dedicated and experienced professionals who provide valuable support to icddr,b’s research and clinical services.

SUPPORT SERVICES

Over the course of its 50-year history, icddr,b has established itself as a leading public health research institution. Our organisational infrastructure, which aspires to international standards, underpins all our activities. It ensures that our scientists can continue to build upon the organisation’s remarkable legacy, generating research to address the major public health challenges of people living in Bangladesh and beyond.
icddr,b has had a great impact on global health through its innovations and discoveries, as well as on the formation of health policies in Bangladesh and beyond. Our impact stems from sharing key research findings with governmental and other key stakeholders. While such evidence-based advocacy is part of icddr,b’s institutional history, icddr,b’s leadership is redoubling its commitment to a more aggressive advocacy platform. This will complement its science and ensure that its low-cost, scalable solutions and technologies are adopted into policy and practice.

IDEAS INTO ACTION AT CLINTON GLOBAL INITIATIVE

In September 2011, icddr,b participated for the first time in the annual meeting of the Clinton Global Initiative, which convenes leaders from NGOs and public and private sectors to identify solutions to pressing global challenges. Dr. Alejandro Cravioto, icddr,b’s Executive Director made two commitments to action at the New York meeting. The first combined over US$10 million of gifts-in-kind from AmeriCares and MedShare for hospitals in Bangladesh, with icddr,b training 7,600 health workers to raise the quality of care at these hospitals. The second commitment, which CGI recognised as a coveted featured commitment, articulated icddr,b’s innovative approach to global cholera outbreaks, whereby icddr,b will provide technical assistance and AmeriCares will provide the ‘cholera kit’ (all supplies required to treat 15,000 patients).

PARTNERING WITH UN’S EVERY WOMAN EVERY CHILD AND HOSTING UN SECRETARY-GENERAL

On 14 November 2011, icddr,b hosted a visit from UN Secretary-General, Ban Ki-moon, who toured the Dhaka Hospital and met a number of senior scientists. The Secretary-General enjoyed meeting mothers and children in both the Short Stay Ward and the Nutrition Rehabilitation Unit. He later praised icddr,b’s work, especially in the area of child health. The following evening, icddr,b joined the UN Foundation in hosting a private-sector engagement dinner in support of the Secretary-General’s Every Woman Every Child initiative.

HOSTING GAVI ALLIANCE BOARD

icddr,b has a long history in clinical trials and the generation of evidence on the use of vaccines. As a result, members of the Board of the GAVI Alliance chose to make site visits to icddr,b in November 2011, while in Dhaka for their board meeting. Board members visited icddr,b’s Dhaka headquarters as well as the Matlab and Kamalapur field sites. These visits provided an opportunity for GAVI’s leadership to see first-hand how icddr,b and its proximity to health challenges provides evidence and generates demand and technology adoption in resource-constrained countries.
Her Royal Highness Princess Anne of the United Kingdom touring the Dhaka Hospital with Medical Director Dr. Mark Pietroni.
"I highly commend the noble work being done by icddr,b. Your humanitarian work to save human lives, particularly young children, is very much appreciated.

United Nation stands ready to work with you.

K. R. B."

UN Secretary-General Ban Ki-moon’s entry in icddr, b's visitors book.
icddr,b’s Strategic Plan 2020 (SP2020) provides an institutional roadmap that is actionable, flexible and above all, can be evaluated on an ongoing basis. The key to realising the benefits of the strategic plan lies in effective implementation. 2011 marked significant progress towards integration of the SP2020, with the establishment of the new scientific research centres and the ongoing transformation of key business processes. Given an increasing donor and partner emphasis on impact evaluation and accountability, these efforts to improve transparency and monitoring and evaluation are critically important to icddr,b’s competitiveness in the global health arena.

Ensuring Accountability and Transparency

The strategy and internal oversight team has been working with the research centres and services in three key areas:

Strategy: Successful implementation of SP 2020 requires a collaborative approach. In 2011, the Strategy team worked with 10 research centres and seven service areas to develop tactical plans. Tactical plans contain an annual work-plan and a three-year focus, and serve as a guideline for meeting the strategic objectives. The existing Monitoring & Evaluation Framework, which was created in 2007 is not aligned with SP 2020. Hence, a new Performance Assessment Framework has been developed, based on a Balanced Scorecard concept. Balanced Scorecard comprises of four dimensions: financial, stakeholder, internal process, and learning and growth. Together these tools will improve operational consistency across the organisation and enable the leadership to assess efficiency and effectiveness.

Governance, Risk, and Compliance: Approval of the Institutional Governance Framework (IGF) by the Board of Trustees in November 2010 enabled the Governance, Risk & Compliance (GRC) team to focus on implementation in 2011. Key activities included: IGF awareness-raising sessions; efforts to embed a ‘risk culture’ by encouraging identification, assessment, and reporting of risks and opportunities on a continuous basis; strengthening the Enterprise Risk Management Framework; conducting the annual risk assessment and reporting to the Audit Committee. Although the core donors commission a joint audit of icddr,b activities, other funders operate independently. This creates a need for multiple audits and reviews in order to satisfy donor funding conditions. In 2011, the GRC team coordinated a record 29 external audits/reviews.

Internal Assurance: The creation of an internal audit function has been a key initiative of Executive Director Dr. Alejandro Cravioto to improve the effectiveness of icddr,b’s operations. icddr,b is now implementing a cost-effective internal audit system, now named Internal Assurance, in line with international best practice. In 2011 the team has completed the internal assurances of Facilities Management Services, Information Technology, Finance, Procurement, Hospitals, Global Fund RCC Project and Laboratories. The function acts as an enabler, advising and supporting all functions on process improvement and cost optimisation initiatives.

‘The major changes taking place that permeate all the work and activities of the institution under the SP 2020 look promising in moving icddr,b towards an organisational functioning that is more strategic, systematic and effective.’

Institutional Assessment Report by the Core Donor Group, December 2011
Human Resources

The success of an institution depends on its institutional capabilities. This principle is reflected in the Strategic Plan 2020 (SP2020) in which one of the four key objectives for icddr,b’s sustained success is the development of its organisational capabilities. Organisational capacity-building focuses on developing a strong foundation of personnel management practices that will enable sustained excellence in research by attracting, retaining and training the best talent. icddr,b has engaged experts from the international firm, Mercer, to redesign its Human Resources (HR) systems and processes consistent with best practices.

TRANSFORMING ORGANISATIONAL CAPACITY THROUGH COMPETENCY-BASED HR SYSTEM

In 2011, Human Resources and Mercer worked together to identify three areas of focus: organisational effectiveness, people effectiveness, and HR effectiveness. To improve organisational effectiveness, Mercer is helping to simplify job families and grades for easier and effective administration. To strengthen people effectiveness, Mercer is assisting icddr,b in designing technical and leadership competencies for continuous and structured individual development. Finally, to enhance HR effectiveness, Mercer is aligning core Human Resources processes, such as staffing, talent management, talent development, talent rewards and recognition, mentoring, and communications.

A scorecard to track icddr,b’s progress towards developing organisational capacities has been created. It provides baseline scores for icddr,b to track the impact of the redesigned systems on research productivity, talent management, internal service partnership, and cost efficiencies. HR has also been restructured and its capabilities are being enhanced through workshops and one-on-one coaching.

EMPLOYEE ENGAGEMENT SURVEY

In November 2011, all staff at icddr,b were invited to participate in the first annual employee engagement survey. This confidential survey, offered both electronically and manually, gave employees a chance to express opinions about their workplace experience. The results created a baseline against which future surveys can be assessed, and provided invaluable feedback to icddr,b leadership at a time of organisational change.

E-RECRUITMENT—FINDING THE BEST TALENT EFFICIENTLY

icddr,b launched a redesigned online system in June 2011 as part of ongoing efforts to enhance the recruitment and selection processes and improve the efficiency of business processes. The new approach enables the Human Resources team to streamline the recruitment cycle—reducing recruitment costs, reaching a wider pool of applicants and finding cost-effective ways to build a talent bank for future vacancies and handling high-volume job applications.
The ability to attract funding and to spend it wisely underpin an organisation’s ability to survive and thrive. We are proud of our scientists, who compete internationally to secure funding, and are indebted to our core donors, whose financial contributions are testimony to their belief in the global benefits of our research. As good stewards, our monitoring and evaluation ensures that every taka invested in icddr,b is spent to improve the health outcomes of those living in poverty in Bangladesh and beyond.
2011 Finance Report
(Amounts in US$000’s)

This report represents a summary discussion of the financial activities of icddr,b (the institution) for the fiscal year ended December 31, 2011. The Statement of Net Assets provides information on the institution’s financial position as a whole, including the assets and liabilities of the Employment Separation Payment Fund (ESPF), which are incorporated for the first time. This is historic since previously icddr,b’s external auditor qualified the audit opinion because of the ESPF’s exclusion from the institution’s financial report.

Table 1 shows combined net assets, which increased from $28,700 to $48,700. The increase is largely due to the addition of over $20,000 of ESPF investments. If ESPF investments are excluded, restricted assets increased by $5,000. This increase is attributed to a significant rise in restricted project activity of over $10,000, contributed by the Bill and Melinda Gates Foundation ($5,400), UNICEF Bangladesh ($1,400), EKN ($809), University Research Co ($522), University of Virginia ($451), Johns Hopkins (401) and others.

Unrestricted net assets, which can be used to finance day-to-day operations without donor constraints, decreased from $25,400 in 2010 to $19,700 in 2011. This is due to significant reductions in cash, endowment funds, and core donor receivables, as well as the institution’s deficit. While the Governments of the Netherlands and Switzerland have withdrawn from core funding, the remaining core donors—AusAID, CIDA, DFID, and Sida—have either maintained or are expected to increase their contributions.

Table 1: Net Assets
(US$ ’000)

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<th>2011</th>
<th>2010</th>
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<tr>
<td>Current and other assets</td>
<td>63,769</td>
<td>40,047</td>
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<tr>
<td>Capital assets</td>
<td>20,046</td>
<td>18,246</td>
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<tr>
<td>Current and other liabilities</td>
<td>(35,912)</td>
<td>(29,622)</td>
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<tr>
<td><strong>Net Assets</strong></td>
<td>47,903</td>
<td>28,671</td>
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<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted</td>
<td>28,181</td>
<td>3,302</td>
</tr>
<tr>
<td>Unrestricted</td>
<td>19,722</td>
<td>25,369</td>
</tr>
<tr>
<td><strong>Total Net Assets</strong></td>
<td>47,903</td>
<td>28,671</td>
</tr>
</tbody>
</table>

Table 2: Changes in Net Assets
(US$ ’000)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor Contribution</td>
<td>49,428</td>
<td>34,697</td>
</tr>
<tr>
<td>Endowment Transfer</td>
<td>2,300</td>
<td>1,825</td>
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<tr>
<td>Other</td>
<td>3,432</td>
<td>3,008</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>55,160</td>
<td>39,530</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programme</td>
<td>41,724</td>
<td>27,173</td>
</tr>
<tr>
<td>Management and Administration</td>
<td>14,536</td>
<td>12,154</td>
</tr>
<tr>
<td>Fundraising</td>
<td>397</td>
<td>155</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>56,657</td>
<td>39,482</td>
</tr>
<tr>
<td><strong>Increase (Decrease) in Net Assets</strong></td>
<td>(1,497)</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 2 reflects a deficit in unrestricted operations of $1,497. The deficit arose primarily because of weak budgetary controls in the first half of 2011. In the later part of the year, icddr,b implemented a Board-approved, cost-containment programme, which is beginning to yield positive results.

The rise in programme activity demonstrates icddr,b’s ability to attract project funds from sources globally, with project revenue increasing by 38% from $40,000 to $55,000. Programme costs increased by $14,500 or 54% in the same period. Management and administration expenses increased by $2,400 in part due to salaries previously allocated to a major project, which ended in June 2011.

Other reasons for the increase include: reversal of excess provisions in 2010 ($660), the competency-based Human Resources Consultancy ($456), purchase of a generator for the Hospital Building ($400), full-year expenditure for Audit and Deputy Executive Director’s units ($150) and promotion of scientific staff. Fundraising expenses relate to the Fundraising Support Service agreements.
BUDGETARY HIGHLIGHTS

icddr,b has succeeded in reducing a forecast deficit of over $4,000 to a deficit of $1,500. This was made possible by a combination of cost-containment measures and the one-time withdrawal from endowments of $2,300. Savings were made in salaries ($328), supplies ($466), repairs and maintenance ($225), consultancy ($150) and others. Overhead recovery of $654 was lower than forecast. Ensuring that funders contribute sufficiently to overhead recovery is a priority for future years. Management is committed to identifying areas of inefficiency and reducing the deficit. These steps include enhanced cost consciousness and tighter budgetary control across the organisation, closure of non-essential units, non-replacement of retiring employees and limited hiring with use of unrestricted fund. Additional measures include a voluntary retirement initiative, comprehensive evaluation of staffing levels and monthly performance monitoring. Other improvements planned for 2012 include a review of the budgeting and budgetary control process, ERP enhancements to improve management reporting, cost allocation and overhead recovery, and evaluation of the capital expenditure and non-stock policies.

For our audited financial statements, please go to www.icddrb.org/2011_financial_statements.

Dr. Simba Mandizvidza CA, CPA.
Director Finance

Donor contributions in 2011
(US$ 51,727,000)

| A | Gates Foundation | 18.6% |
| B | Johns Hopkins University | 5.2% |
| C | Netherlands | 1.6% |
| D | United Kingdom – DFID | 6.6% |
| E | Australia – AusAID | 8.6% |
| F | Bangladesh | 8.9% |
| G | Rockefeller Foundation | 1.3% |
| H | BRAC | 1.1% |

| I | USAID – Washington | 1% |
| J | Others | 10.8% |
| K | Centers for Disease Control and Prevention (CDC) | 6.4% |
| L | GFATM | 7.1% |
| M | USA – Other sources | 3.7% |
| N | Sweden – Sida | 5.1% |
| O | UNICEF | 4% |
| P | USA – NIH | 10% |

Functional Expenses 2011
(US$ '000)

| A | Fundraising | $397 (1%) |
| B | Programme | $41,724 (73%) |
| C | Management and administration | $14,536 (26%) |
## DONOR CONTRIBUTIONS
(USS ‘000) - abridged

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia - AusAID</td>
<td>4,435</td>
<td>422</td>
</tr>
<tr>
<td>Bangladesh - IHP</td>
<td>352</td>
<td>1,970</td>
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<tr>
<td>Bangladesh - Others</td>
<td>4,236</td>
<td>1,342</td>
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<tr>
<td>Canada - CIDA</td>
<td>15</td>
<td>3,290</td>
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<tr>
<td>The Netherlands</td>
<td>2,400</td>
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<tr>
<td>Bangladesh Rural Advancement Committee (BRAC)</td>
<td>579</td>
<td>546</td>
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<tr>
<td>Centers for Disease Control &amp; Prevnl. (CDC)-Atlanta</td>
<td>3,307</td>
<td>3,635</td>
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<tr>
<td>Gates Foundation</td>
<td>9,645</td>
<td>3,072</td>
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<td>Global Forum for Health Research</td>
<td>-</td>
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<tr>
<td>Global Fund for AIDS, TB and Malaria (GFATM)</td>
<td>3,666</td>
<td>1,018</td>
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<tr>
<td>Japan-JICEWELS &amp; Others</td>
<td>79</td>
<td>95</td>
</tr>
<tr>
<td>Johns Hopkins University (JHU)</td>
<td>2,680</td>
<td>1,502</td>
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<tr>
<td>Johns Hopkins University (JHU)/USAID</td>
<td>-</td>
<td>14</td>
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<tr>
<td>The Netherlands</td>
<td>809</td>
<td>22</td>
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<td>Save the Children, USA</td>
<td>336</td>
<td>382</td>
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<tr>
<td>Sweden - Sida/SAREC</td>
<td>2,634</td>
<td>2,167</td>
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<tr>
<td>Thrasher Research Fund</td>
<td>116</td>
<td>95</td>
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<tr>
<td>The Rockefeller Foundation</td>
<td>694</td>
<td>138</td>
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<tr>
<td>United Kingdom - DFID</td>
<td>3,387</td>
<td>3,101</td>
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<td>Endowment Fund - Centre</td>
<td>300</td>
<td>832</td>
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<tr>
<td>USA - NIH</td>
<td>5,164</td>
<td>3,779</td>
</tr>
<tr>
<td>USA - Other Sources</td>
<td>1,821</td>
<td>1,337</td>
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<tr>
<td>UNICEF</td>
<td>2,093</td>
<td>593</td>
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<tr>
<td>United Nations Population Fund (UNFPA)</td>
<td>288</td>
<td>97</td>
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<tr>
<td>WHO</td>
<td>369</td>
<td>319</td>
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<tr>
<td>World Bank</td>
<td>17</td>
<td>22</td>
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<tr>
<td>USAID-Washington</td>
<td>522</td>
<td>-</td>
</tr>
<tr>
<td>Others (net) (a)</td>
<td>2,633</td>
<td>1,845</td>
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<tr>
<td>Bangladesh/United States Department of Agriculture (USDA)</td>
<td>(550)</td>
<td>1,473</td>
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<tr>
<td>Endowment Fund-Hospital</td>
<td>2,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

**Total Contributions (b):**

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>51,727</td>
<td>36,523</td>
</tr>
</tbody>
</table>

(a) Contributions in 2011 from “Others” for project funds include: Action Aid International; ACME Laboratories Ltd.; Alive and Thrive-Bangladesh; CARE Bangladesh; CHNRI; C-it-The Netherlands; Cordaid-The Netherlands; Dhaka Shishu Hospital; Drugs for Neglected Diseases Initiative (DNDI); Ecole Polytechnique Federale de Lusanne (EPFL); Enfants du Monde (EdM), Bangladesh; Erasmus University-Rotterdam; Engender Health; Food and Agriculture Organization (FAO); GIZ, Germany; GlaxoSmithKline (gsk); Global Alliance for Improved Nutrition (GAIN); Gynuity Health Projects; INDEPTH Network; Institut Pasteur, France; Institute of Tropical Medicine (ITM), Belgium; Interactive Research & Development (IDR FZC), UAE; International Atomic Energy Agency (IAEA), Austria; International Labour Office (ILO); International Vaccine Institute (IVI); International Rice Research Institute (IRRI); Islamic Development Bank (IDB); ITO Supporting Comity, Japan; James P Grant School of Public Health, BRAC University, Dhaka; KNCV Tuberculosis Foundation-Netherlands; Karolinska Institute-Sweden; Leiden University Medical Center-The Netherlands; MP Biomedicals Asia Pacific Ptd. Ltd.; Malaria Research Initiative Bandarban (MARIB); Marie Stopes International; Medical Research Council (MRC); McGill University, Canada; Nestec Ltd.-Switzerland; Napo India Private Ltd.; Nestle Foundation-Switzerland; Population Council, USA; Research Institute for Humanity and Nature (RIHN); Results for Development Institute, Inc., USA; Stiftung zur Foerderung der gastroenterologischen Forschung (FGF), Switzerland; The University of Melbourne; The Hospital for Sick Children; UNDP-Bangladesh; USB Optimus Foundation; Swiss Academy of Medical Sciences (SAMS); University of Cambridge-UK; University of Sydney; University of Manitoba, Canada; University of Queensland, Australia; Uppsala University, Sweden; World Food Programme (WFP); Wellcome Trust-UK; and Donations from various individuals.

(b) Includes CHRF self and partner income of US$ 4,586,331 under a fund management agreement.
A community health worker at one of Matlab’s 41 fixed site clinics, with one of the children under her care.
Governance Structure

BOARD OF TRUSTEES

ciddrb’s Board of Trustees comprises 17 health professionals and researchers representing both developed and developing countries. The Board was created by an Ordinance of the Government of the People’s Republic of Bangladesh. Three members are nominated by the People’s Republic of the Government of Bangladesh, with the World Health Organization and UNICEF nominating one member each. ciddrb’s Executive Director serves as the Member-Secretary. The Board operates under the ciddrb Ordinance and the accompanying Board of Trustees Bylaws. The Board of Trustees’ roles and responsibilities include fund oversight; approving and monitoring the budget; setting broad institution-wide policies, as well as monitoring adherence to the Strategic Plan 2020; employing, evaluating and supporting the Executive Director; maintaining the line between governance and management; and evaluating the Board’s own performance.

iciddrb’s Board of Trustees as of 31 December 2011:

Chairperson
Dr. Nicolaus Lorenz
Head of the Swiss Centre for International Health
Deputy Director, Swiss Tropical and Public Health Institute
Switzerland

Member-Secretary (ex-officio)
Dr. Alejandro Cravioto
Executive Director
iciddrb

Representing Government of Bangladesh
Mr. Humayun Kabir
Senior Secretary
Ministry of Health & Family Welfare
Government of the People’s Republic of Bangladesh
(to September 2011)

Mr. M. Musharraf Hossain Bhuiyan
Senior Secretary, ERD
Ministry of Finance
Government of the People’s Republic of Bangladesh
(to October 2011)

Mr. Iqbal Mahmood
Senior Secretary, ERD
Ministry of Finance
Government of the People’s Republic of Bangladesh
(to October 2011)

Prof. Dr. Md Suhrab Ali
Professor of Biochemistry
Northern International Medical College
Bangladesh

Representing UNICEF
Mr. Carel de Rooy
Country Representative
UNICEF-Bangladesh
(to December 2011)

Representing WHO
Dr. Elizabeth Mason
Director
Department of Child and Adolescent Health
and Development
And Director, a.i.
Department of Making Pregnancy Safer
World Health Organization

Independent Members
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Chairman
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The University of Tehran
Iran

Prof. Zulfiqar Ahmed Bhutta
Professor & Founding Chairman
Division of Women & Child Health
The Aga Khan University
Pakistan

Dr. Norma Binsztein
Instituto nacional de Enfermedades Infecciosas
ANLIS “Carlos G. Malbrán”
National Ministry of Health
Argentina

Dr. Thomas Cheasty
Head
Gastrointestinal Infections Reference Unit
Laboratory of Gastrointestinal Pathogens
GEZL, HPA Centre for Infections
United Kingdom

Dr. Ann Larson
Director
Combined Universities Centre for Rural Health, Western Australia
Australia

Dr. Mary Elizabeth Wilson
Associate Professor of Global Health and Population
Harvard School of Public Health
Associate Clinical Professor of Medicine
Harvard Medical School
USA

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Division of Women & Child Health
The Aga Khan University
Pakistan

Prof. N K Ganguly
National Institute of Immunology
New Delhi
India

Dr. Mary Ann D. Lansang
Director
Knowledge Management Unit
The Global Fund to Fight AIDS, TB and Malaria
Switzerland
(to December 2011)

Dr. Edward J Mills
Canada Research Chair, Global Health
Associate Professor, Health Science
Faculty of Health Sciences
University of Ottawa
Canada

Dr. José Ignacio Santos Preciado
Lab. de Infectologia Microbiologia e Immunologia Clinicas
Departamento de Medicina Experimental
Facultad de Medicina
Universidad Nacional Autonoma de Mexico
Mexico
(to December 2011)