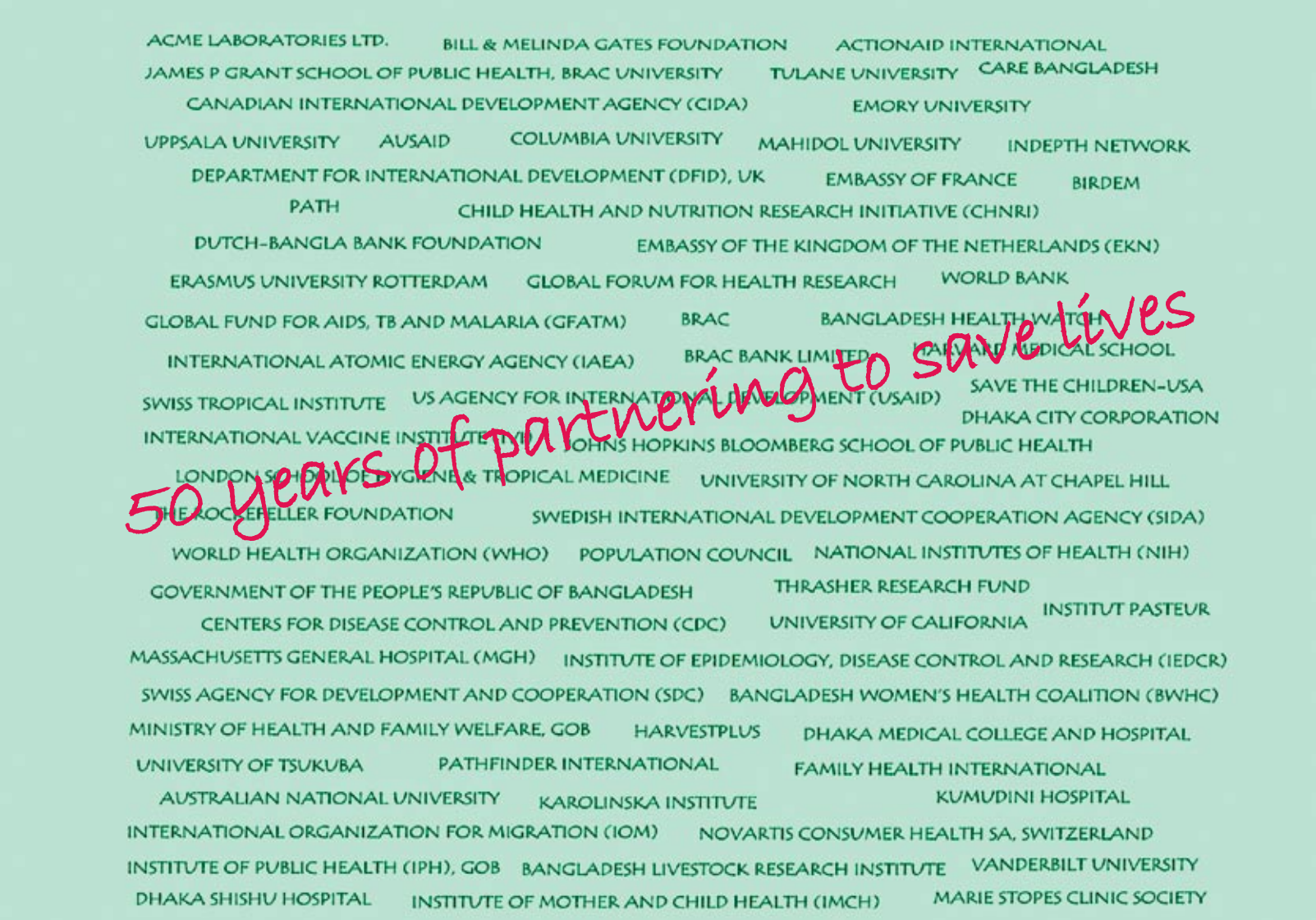

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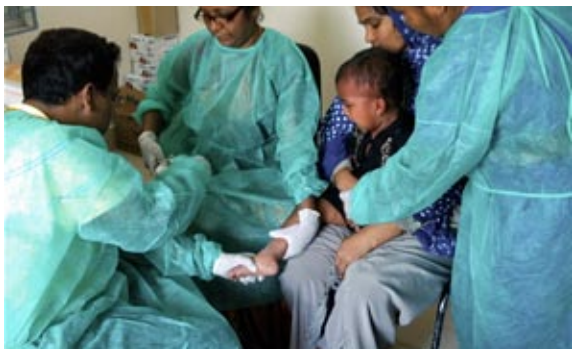

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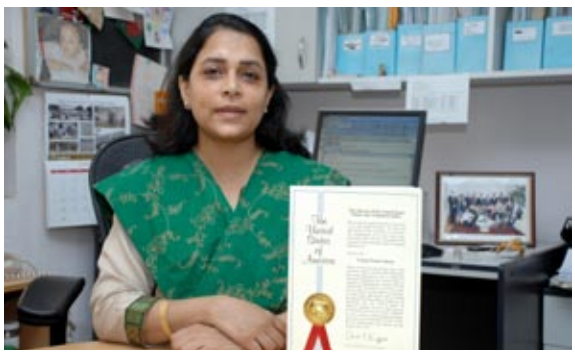

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ICDDR,B to go ahead with restructuring plan

The recent meeting of the ICDDR,B's Board of Trustees on 27-28 November endorsed a test-run for implementation of the restructuring plan of ICDDR,B. The Board also reviewed activities relating to the administrative and financial management during the past six months.

The Strategic Plan 2020 (SP2020) urged a restructuring of ICDDR,B to systematise its research activities under the umbrella of 10 `Centres of Excellence' rather than scientific divisions and theme-based 'programmes' that have been in place for quite a long time. These changes are intended to remove the redundancy of work in various divisions and programmes and to build a multidisciplinary team of researchers with appropriate expertise and skills to address a specific issue in a holistic approach.

The restructuring plan was finalised through a participatory process, i.e. through a rigorous opinion survey among the relevant scientific staff members at ICDDR,B during the last two years.

The 10 proposed `Centres of Excellence' are:

- Vaccine Sciences
- Nutrition and Food Security
- Communicable Diseases
- Chronic Diseases
- Child and Adolescent Health
- Food and Waterborne Diseases
- Reproductive Health
- Equity and Health Systems
- HIV/AIDS and Population
- Urbanisation and Climate Change

The Board observed that 59% of the scientific staff voted for a test-run with the first four centres in the above list before full-scale implementation of the restructuring plan. These four have undergone scrutiny and crossed the hurdles of Phase I which involved decision-taking by relevant workers about which research groups might make up a centre.

In his report to the staff at the Sasakawa International Auditorium on 28 November, Chair of the Board Dr Nicolaus Lorenz declared the Board's decision that four centres enter Phase II of the restructuring process (which means actually beginning the work) while the remaining six undergo scrutiny in Phase I.

The Board also endorsed the timeframe to implement the new classification of scientific staff from July 2012. Despite a budgetary deficit, the Board approved a pay increase of 12% to the GS and NO-level staff, considering price hike of essential commodities in the country.

Four board members: Dr Timothy G Evans, Dr Peter Tugwell, and Mr Shaikh Altaf Ali, who have completed their respective tenures on the Board, were bade farewell. The newly-selected board members are: Mr Md Humayan Kabir of Bangladesh, Dr Elizabeth Mason of the World Health Organization, Professor Zulfiqar A Bhutta of Pakistan, Professor NK Ganguly of India, and Professor Edward J Mills of Canada.

The next meeting of the Board will be held on 18-19 June 2011.

New Trustees

Dr Elizabeth Mason, Director, Child and Adolescent Health, World Health Organization (WHO), replaced Dr Timothy Evans as a WHO representative on the Board. Dr Mason had her MbChB degree from the University of Leeds, UK. She earned a Diploma in Child Health and an MSc in Community Medicine in London. She also gained experience of working as a Fellow Faculty of Public Health in the UK. Her fields of expertise are maternal and child health as well as public health. Dr Mason spent 24 years of her life living and working in Zimbabwe, including 13 years with the Ministry of Health, initially at the district level responsible for a 90-bed hospital, and then at the national level as Deputy Director, Maternal and Child Health responsible for development, implementation, and monitoring and evaluation of maternal and child health services. She has subsequently been working for WHO for several years with various responsibilities in regional offices in Southern Africa and finally at the WHO headquarters in Geneva.

Mr Md Humayan Kabir is currently Secretary to the Ministry of Health and Family Welfare of the Government of Bangladesh. During 2007-2010, he worked as Secretary to the Election Commission Secretariat and Managing Director of Shadharan Bima Corporation—the only general insurance company in the public sector in Bangladesh. As a devoted civil servant, he worked previously in other important positions in the Cabinet Division, Ministry of Civil Aviation and Tourism, Ministry of Primary and Mass Education, Ministry of Establishment, Ministry of Water Resources, Ministry of Environment and Forests, and Ministry of Finance. Mr Kabir earned his MA in Development Administration and Management from the University of Manchester, UK, preceded by a Postgraduate Diploma in Development Administration from the same university and Masters degree in Bangla Literature from the University of Dhaka, Bangladesh.

Professor Zulfiqar A Bhutta, a Pakistani citizen, is currently Professor and Chairman of the Department of Paediatrics & Child Health, Aga Khan University Medical Center, Karachi, Pakistan. He had his MBBS degree from Khyber Medical College under University of Peshawar, Pakistan and was adjudged the 'Best Graduate of the Year'. He was awarded the University Gold Medal for distinction. Later, he had a Diploma in Child Health from Royal College of Physicians and Surgeons, London, an MRCP in Paediatrics from the UK, an FCPS from Pakistan, and again an FRCP from Edinburgh, UK. He earned also a PhD degree from the Karolinska Institute at Stockholm, Sweden. With areas of expertise in nutrition, common childhood infections, clinical neonatology, and general paediatrics, he received a number of awards and honours throughout his life and worked as professor, paediatrician, surgeon, clinical attaché in a number of academic and medical institutions. Professor Bhutta has professional attachment with, and has contributed to, numerous international and national societies, academic committees, and organisations. He has to his credit hundreds of scientific articles published in peer-reviewed national and international journals and reports and has undertaken responsibility of editor and reviewer for many publications. Professor Bhutta has delivered lectures in various educational institutions and universities.

Indian national Professor NK Ganguly is the Distinguished Biotechnology Professor and Advisor at Translational Health Science & Technology Institute as well as President, Jawaharlal Institute of Postgraduate Medical & Education Research and Vice President, Central Council for Research in Ayurveda & Siddha, Ministry of Health & Family Welfare, India. Previously, he was Advisor to Union Minister of Health & Family Welfare and Director General, Indian Council of Medical Research. Earlier, he served in various important positions in many other institutions. Professor Ganguly had his MBBS degree from the University of Calcutta and an MD degree in Microbiology from the Postgraduate Institute of Medical Education and Research. During 2000-2007, he obtained DSC degree consecutively from four institutions in India. His fields of expertise are: infectious disease, immunology, and biotechnology; he has 40 years of teaching and research experience. Professor Ganguly received many prestigious awards and honours for his outstanding work and contributed to many institutions both locally and globally through his lectures, consultancy, and advisory services. He is a prolific author and has to his credit nearly 1,000 papers published in national and international journals, books, and reports; he also worked as editor and reviewer of several publications.

Professor Edward J Mills is currently Canada Research Chair and Associate Professor at the University of Ottawa as well as a Research Scientist at the BC Centre for Excellence in HIV/AIDS in Canada. He had his LLM degree in International Human Rights Law from Oxford University, UK, a Masters degree in Evidence-based Health Care with a focus on Clinical Trial Design from the same university, followed by a PhD in Health Research Methods from McMaster University. Professor Mills has held, and continues to hold faculty, advisory and supervisory positions in various universities and organisations, such as McMaster University, Canada; Rhodes University, South Africa; The Aids Support Organization (TASO), Uganda; Mildmay Uganda; and others. Of his versatile research interest, HIV/AIDS has been a subject of heed. He contributes profusely to popular journals and books and is the Editor of the journal *Conflict and Health*.

A groundbreaking discovery by ICDDR,B scientists

A groundbreaking discovery by ICDDR,B scientists startled audiences of the world media in early November 2010. The work of Dr Shah M Faruque and his colleagues demonstrated how apparently-innocent cholera germs become deadly pathogens by interacting with certain viruses. Dr Shah Faruque is Head of Molecular Genetics at ICDDR,B. Other investigators in Dr Faruque's research team, who contributed in this pioneering work, are Dr M Kamruzzaman and Faizule Hassan. Professor John Mekalanos of the Harvard Medical School in Boston collaborated with this team.

From left to right are: Assistant Scientist Dr M Kamruzzaman, Head of Molecular Genetics Dr Shah M Faruque, and Research Officer Faizule Hassan

Immediately after publication of their research findings in the world-renowned Science journal *Nature* [for details, visit the *Nature*'s website at: http://www.nature.com/nature/journal/v467/n7318/full/nature09469.html], almost all leading media, both at home and abroad, had special coverage of the discovery. These included news items, features, post-editorials, and editorials. BBC and Voice of America also interviewed the team leader Dr Faruque.

Cholera, a severe form of watery diarrhoea, is caused due to infection by a bacterium called *Vibrio cholerae* which produces a potent toxin known as cholera toxin. However, *V. cholerae* as a species is also a normal inhabitant of the aquatic environment but most of these environmental bacteria are not able to produce cholera toxin and, hence, are non-pathogenic. Scientists predict that the pathogenic bacteria emerge from environmental non-pathogenic *V. cholerae* through a series of evolutionary changes that finally enable them to produce cholera toxin.

ICDDR,B scientists have recently explained the molecular mechanisms for the evolution of precursor non-pathogenic *V. cholerae* to deadly pathogens that cause cholera in humans. This fascinating work describes how a number of viruses (bacteriophages) sequentially interact with apparently-harmless environmental strains of *V. cholerae* that eventually turn into dreadful pathogens responsible for severe outbreaks of cholera across continents, affecting millions of people.

Strains of *V. cholerae* become capable of producing cholera toxin only when infected by the virus known as the 'CTX phage'. However, for CTX phage to be able to infect *V. cholerae*, a number of other phages first infect the bacteria and make them ready for being infected by the CTX phage. Faruque and co-workers have previously reported their discovery of several of these phages. Their recent discovery and characterisation of a phage called 'TLC phage' (which has a crucial function in this process) have finally enabled them to demonstrate the complete evolutionary pathway involved in toxigenic conversion of *V. cholerae*. By infecting *V. cholerae*, the TLC phage slightly changes the chromosomal sequence of the bacteria and creates a special sequence where an incoming CTX phage genome can be incorporated. This work now explains the exact molecular changes that occur in the *V. cholerae* chromosome before the bacteria can stably acquire CTX phage and become a toxigenic pathogen.

The recent discovery of additional phages and their functions have far-reaching implications in predicting the emergence of new bacterial pathogens through virus-bacteria interactions in the environment. This knowledge will also help construct more efficacious vaccine strains which will not have the ability to revert to pathogenic form. Furthermore, environmental monitoring for precursor strains will help predict the emergence of new *V. cholerae* strains with epidemic potential from environmental non-pathogenic bacteria. When asked to comment on their work, the team leader Dr Faruque said "We discovered and characterised the TLC phage which changes, albeit slightly, the chromosomal sequence of the cholera bacterium....This subtle change enables an incoming toxigenic CTX phage genome to be incorporated and in doing so an apparently-harmless strain of *V. cholerae* is transformed into a dangerous killer."

The recent results published by Dr Faruque and co-workers not only describe the role of new phages in this evolutionary pathway but also constitute a major breakthrough in understanding the precise molecular mechanisms involved. The collaborative efforts between Dr Faruque and Dr Mekalanos had previously led to the development of models elucidating the occurrence of seasonal cholera epidemics in Bangladesh and explained why the cholera epidemics end in a self-limiting way.

Applauding the works of Dr Faruque and co-workers, ICDDR,B's Executive Director Dr Alejandro Cravioto said "ICDDR,B is dedicated to saving lives through treatment and research....The publication of these findings in a journal like *Nature* shows not only the quality of our research, but also how we are producing new science that can help explain diseases and, more importantly, how these can be prevented."

Cholera continues to be a major health problem in many developing countries in Asia, Africa, and South America. The World Health Organization (WHO) estimates that one million people are infected with cholera each year and that more than 100,000 people are killed by the disease. Recent epidemics in sub-Saharan African countries, such as Zimbabwe and Mozambique, the post-flood epidemics in Pakistan, and most recently in Haiti highlight the continuing threat of cholera and the necessity of further in-depth research, like that of Dr Faruque and colleagues, for undertaking more effective interventions for the treatment and prevention of cholera.

DFID: ICDDR,B's friend in times of need

The Department for International Development (DFID)-UK is one of the very few donors who have provided financial assistance for both core and project activities of ICDDR,B. Over the last decade, many of our development partners stopped providing money for the unrestricted core fund that bears the expenses for patient-care activities at the hospitals, infrastructural development, and portions of salaries of the management and support services staff. While most donors started limiting their support only to our research projects—quite often imposing strict conditions—DFID emerged as our generous friend to support both core and project activities since the late 1990s. In this feature, we are delighted to highlight the institutional profile and global activities of DFID in general, and its collaboration with ICDDR,B in particular.

As the international aid agency of the UK Government, DFID emerged as a separate department in 1997 from the Foreign and Commonwealth Office. DFID's primary goal is to provide support for sustainable development and reduce extreme poverty in countries of the developing world. Since health status of the people of a nation is directly associated with its income-generating economic activities, a substantial proportion of DFID's funds is dedicated to health research and interventions, with a focus on the development of health systems infrastructure, exploring social determinants of health, and addressing gender inequalities in healthcare. The Department's Health Resource Centre is an international consortium to provide high-quality advice, expertise, and knowledge in public health for health systems in low- and middle-income countries. Inclusion of a communication research wing in DFID indicates its commitment to the much-needed dissemination of research findings for translating research into actions.

With its headquarters in London and East Kilbride near Glasgow and 64 overseas offices, DFID is led by a senior cabinet minister of the UK Government. DFID's activities are spread over 150 countries of the world, with the total staff strength of 2,600, nearly half of whom work outside the UK. Among the very many development agenda starting from planning to implementation, the struggle of the low- and middle-income countries to achieve the Millennium Development Goals (MDGs) is an important area where DFID extends its generous support. In addition to the donations and grants under bilateral relationship with partner countries, DFID provides multilateral aid, including support to the European Union, World Bank, UN, and other agencies, which eventually benefit some countries that have no direct linkage with DFID. A unique feature of the funding policy of the Department is its flexibility in areas of concern to cope with the emerging issues. The Development Assistance Committee, in its report of 2010, termed DFID 'an international development leader in times of global crisis'.

DFID's assistance to ICDDR,B

Soon after the formation of DFID, the Department helped strengthen the Health and Demographic Surveillance System (HDSS—formerly DSS) of ICDDR,B at Matlab in Chandpur district of Bangladesh. The HDSS-Matlab comprises a meticulous record-keeping system and geographic information system. The HDSS collects data on vital events, including births, deaths, marriages, in- and out-migrations, and illness episodes among 210,000 people in its catchment area. This longitudinal dataset accumulated since 1966 has been a unique global resource for important studies through secondary analyses of data, i,e. cause-and-effect studies can easily be undertaken without manipulation of fresh variables. The traditional method of data collection using paper-registers by the Community Health Workers during home-visitations have been improved dramatically for the introduction of some modern equipment like Personal Digital Assistant (PDA)—a computerized handset—with DFID funding. This modernisation helped feed all data directly from the PDAs to the PCs for storage after necessary screening and cleansing.

Since inception, ICDDR,B has played a very important role in the health sector of Bangladesh, particularly in the area of evidence generation and knowledge creation, and in linking local lessons to global responses in health. It has strived to expand and respond to current and emerging needs despite great challenges. DFID will continue to stand by ICDDR,B, supporting its core and project activities and looks forward to more success in the future.

Ms Shehlina Ahmed
Health and Population Adviser
DFID, Bangladesh

Several other early grants from DFID for institutional development of ICDDR,B helped us introduce a new Management Information System (MIS), build the knowledge base in attaining equitable health for the poor, and reorganise and expand the Health Economics Unit—all during 2001-2006. The largest grant of 7,500,000 pound sterling ever made by DFID to the unrestricted core fund is still being used for institutional development of ICDDR,B. The activities started from 2006. Only 7,000 pound sterling is awaiting release by June 2011. This resulted in computerisation of patient-records, thus, establishing a truly 'paperless' working environment in our hospitals and improved patient-care in better living conditions. While announcing this grant, Mr Hilary Benn, International Development Secretary of DFID-UK, stated that "health is at the heart of the Millennium Development Goals and if we are to achieve them, all poor people must have access to good basic healthcare, which includes family planning, clean water, and health information."

Although most project funding at ICDDR,B is not meant for institutional development, results of some research projects do help us provide technical guidelines for the Bangladesh Government to restructure or re-orient the public health systems for better and/or equitable healthcare. "Future Health Systems: Making Health


An AIDS patient being treated at the Voluntary Counselling and Testing Unit of ICDDR,B

Systems Work for the Poor" is such a project implemented during 2005-2010 with DFID funding through Johns Hopkins University which collaborated with ICDDR,B in this work.

Although Bangladesh is one among those countries that have low prevalence of HIV and AIDS, with the exception of some vulnerable groups such as injecting drug-users, national programme planners are aware of the consequences of a suspected HIV/AIDS epidemic among the general population if appropriate preventive measures are not taken now. ICDDR,B being the technical partner to the Bangladesh Government in their STI/HIV interventions, DFID has so far funded or co-funded several of our activities for surveillance and studies of STIs and/or HIV in the country.

Other areas of ICDDR,B studies that DFID provided fund for include: cost-effectiveness of introducing additional infant vaccines; identifying the factors influencing nurses' behaviour; new system of service-delivery in family planning; childhood drowning; neonatal survival through large NGO interventions in rural areas; non-food emergency relief programme; safe motherhood programmes in South Asia; targeting the poorest of the poor in achieving the Millennium Development Goals; Community-based responsive feeding programme; health security for disaster resilience; menstrual regulation and abortion; surveillance and treatment of swine flu; and sanitation and hygiene-related applied research for equity.

Activities using DFID's fund have not always been limited to Bangladesh. A sub-Saharan country, Mozambique also benefited from an ICDDR,B's work on the risk management of infectious diseases.

Most of the above-listed activities have already been completed, and some are nearing completion. A major activity relating to a systematic review to explore the most effective way of working with private care providers in post-conflict and fragile states in the field of primary healthcare service delivery is expected to be completed by 2011. ICDDR,B is confident of conducting more of such systematic review and has recently applied to DFID for another grant on systematic review. Another activity titled "New vaccines: from licensing to adoption" will continue till 2013.

In addition to financing the core and project activities of ICDDR,B, DFID has extended their help to ICDDR,B in holding a congress of the Commonwealth Association for Paediatric Gastroenterology and Nutrition (CAPGAN) in 2006.

We look forward to receiving more funds from DFID—our friend in times of need—for research in newer areas of activities in the years to come.

ICDDR,B's first patent for a new diagnostic method for TB

ALS, which stands for **A**ntibodies produced by peripheral blood **L**ymphocytes in culture **S**upernatant, is a new diagnostic tool for tuberculosis. Developed by ICDDR,B scientists, ALS received a patent from the Director of United States Patent and Trademark Office. This rapid diagnostic method is based on the analysis of blood and, thus, makes it easier to diagnose tuberculosis (TB) both in adults and children who are unable to produce sputum samples needed in the traditionally-available tests. The two inventors of this novel method are Dr David A Sack, former Executive Director of ICDDR,B and Dr Rubhana Raqib, Senior Scientist of the Nutritional Biochemistry Unit of ICDDR,B.

TB, caused by a pathogen called *Mycobacterium tuberculosis*, is a major public-health problem globally. It causes around 3 million deaths annually in the world. Bangladesh's position is 6th among countries that have the highest burden of TB. Early detection of TB is the key to an efficient control programme because if treatment is given early in the course, the outcome improves and also limits the spread to others.

Traditional tests available for the diagnosis of TB include: microscopy, culture, and polymerase chain reaction (PCR). All these require a sputum sample from a patient suspected to have TB. Chest x-rays may also help diagnose TB. The limitations of these tests are briefly described below.

Dr David A Sack

The microscopic examination and chest x-ray are not 100% reliable; the sputum culture method is not available in most developing countries and takes several weeks to get a result. The PCR quite often yields false-positive results.

Another method called Mantoux test, done on skin, is not a dependable diagnostic test for active TB; it can only give an indication for latent TB contracted from an earlier exposure.

Dr Rubhana Raqib

Given these limitations, Dr David Sack and Dr Rubhana Raqib tried to find other ways to detect TB infections using blood samples. In the past, other scientists had also tried to use blood samples to detect TB by finding antibodies in the serum, as in an HIV test. However, with their serum test many persons had positive results but did not have active TB. To solve this problem, the ICDDR,B scientists decided to develop a new type of test using antibodies that are produced with lymphocytes which are cultured in the laboratory up to three days. Lymphocytes are the cells in the body that produce antibodies that can be detected in a serum test. By detecting antibodies produced in the laboratory rather than antibodies produced in the patients' sera, the test could successfully identify patients with active TB. Importantly, the new test could differentiate persons who might have antibodies in the serum from a previous BCG vaccine or for other reasons from those with active TB. For the patient, the test involves giving a sample of blood; the result can also be available within a few days.

About the new serological test for TB Dr David Sack said: "The development of the ALS method for identifying patients with active TB provides a potentially-powerful tool for control of this major public-health curse. We anticipate that it will be useful in identifying patients earlier in their disease so they can get started the treatment earlier and, thus, prevent the spread of infection to others. Unlike the standard tests for TB, the ALS can detect infections even when the infection is outside of the lungs. Interestingly, the development of the ALS assay for TB grew out of the previous methods used for evaluating immune responses to new enteric vaccines. This is an example of how research in one area can lead to development of new methods in quite a different disease and how scientists must remain open to extending their findings from one condition to another."

Dr Rubhana Raqib commented: "We are happy to invent a rapid diagnostic method that could be applied for both adult patients and children who are unable to produce sputum, to diagnose TB infection, We hope it will be effectively used in the TB control programmes. This type of research that leads to achieving patents is an incentive for the scientists and could act as an income-generating source for ICDDR,B. We believe this would also encourage other ICDDR,B scientists to apply for patent of their inventions."

The new method uses sophisticated equipment where the cell is separated from the blood and cultured for antibody which is then secreted into the media and enzyme-linked immunosorbent assay (ELISA) test is done. The complete process takes only 48 hours and has 90% accuracy in terms of diagnosis. This method also works well with HIV-related TB patients. Currently, Dr Rubhana Raqib and her team members are working hard to make the test even more simplified by using chemical strips and colour-test to identify TB within 2 hours. This emerging method would not require ELISA test or sophisticated equipment and can be done at peripheral laboratories.

ICDDR,B gets ready to hold ASCON XIII

The Thirteenth Annual Scientific Conference (ASCON XIII) of ICDDR,B will be held from 14 to 17 March 2011 at the Pan Pacific Sonargaon Hotel, Dhaka, Bangladesh. The organising committee is chaired by ICDDR,B's Executive Director Dr Alejandro Cravioto, with Dr Timothy Evans, Dean of the James P Grant School of Public Health under BRAC University and Dr Abbas Bhuiya, Deputy Executive Director of ICDDR,B as co-chairs.

The central theme of the Conference is "Science to Accelerate Universal Health Coverage." divided into seven sub-themes: Policy and regulatory frameworks; Disease burden and healthcare priorities; Service infrastructure and health workforce; Financing; Measurement, monitoring and health information systems; Equity; Experience in Universal Health Coverage. Issues indirectly related to Universal Health Coverage are also being considered for presentation.

It is anticipated that more than 500 scientists, health professionals, programme managers, community organisers, and policy-makers will take part in the Conference. Thus, the forum is expected to provide an opportunity to disseminate and share results of research, experience, and lessons learnt from recent projects and programmes in Bangladesh, the region, and the world at large. All participants are required to register within 31 January 2011 to attend the Conference. For registration fees and other details, prospective participants are requested to click the web link http://centre.icddrb.org/activity/index.jsp?activityObjectID=4681

All external participants are required to procure visas before arrival in Bangladesh. Information about getting visas is available on the ICDDR,B's website. Participants with no Bangladesh Consulate in their countries should contact Ms Loretta Saldanha (loretta@icddrb.org) at least a month before the Conference.