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On 2 March, Her Royal Highness Princess Anne paid a visit to ICDDR,B during a three-day trip to Bangladesh. Led by Executive Director Dr Alejandro Cravioto, senior representatives of ICDDR,B briefed the Princess on how ICDDR,B is contributing to Bangladesh's push towards achieving the Millennium Development Goals, especially MDG 4 and 5, which seek to reduce child mortality and improve maternal health...

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ICDDR,B's Executive Director leads UN probe of Haiti's cholera outbreak

Following the recent outbreak of cholera in Haiti, Secretary-General of the United Nations Ban Ki-moon appointed ICDDR,B's Executive Director Dr Alejandro Cravioto to head a four-member expert panel to investigate the origins of the epidemic. The UN Secretary-General expressed his deep concern at the cholera outbreak that has killed more than 3,400 people across the quake-ravaged country and vowed to find the source of the disease. The expert panel was set up to operate independently with full access to all UN records, reports, facilities, and staff members, as required.

stricken people and, at the same time, shared knowledge of cholera management with the Haitian health workers. They worked closely with the Haitian Ministry of Public Health and Population and the Haitian Medical Association to conduct intensive training sessions for government and non-government healthcare providers on the management and treatment of cholera.

Earlier, two ICDDR,B clinicians had been to Port au Prince, the capital of Haiti. Of them, Dr Azharul Islam Khan assisted the



We are honoured that the UN has asked us to undertake this task. It underlines ICDDR,B's international reputation as one of the world's leading centres in the study, treatment, and prevention of diarrhoeal diseases, especially cholera.

Alejandro Cravioto
Executive Director, ICDDR,B

Considering his expertise and wide-ranging experience in working with cholera and cholera-related issues, Dr Cravioto was chosen to lead the panel, along with three other scientists of international repute: former ICDDR,B trustee Dr Claudio Lanata from the Instituto de Investigacion Nutricional in Peru; former Head of ICDDR,B's Laboratory Sciences Division Dr G Balakrish Nair from the National Institute of Cholera and Enteric Diseases in India; and Dr Daniele Lantagne from Harvard University, USA.

Cholera first broke out in Haiti in October 2010 and after Hurricane Tomas swept the country, the disease rapidly turned into an epidemic. Lack of equipment, basic supplies, and even soaps exacerbated the situation and allowed the deadly disease to spread across the country.

In response to a request from the US-based humanitarian organisation Project Hope, a team of experts in epidemic control and clinical management from ICDDR,B arrived at the island in mid-November 2010. Made up of clinicians, microbiologists, two nursing officers, and a medical officer, the eight-member team provided clinical support to the disease-

Centers for Disease Control and Prevention (CDC), Atlanta, USA and the Haitian Ministry of Public Health and Population while Dr Pradip K Bardhan helped the Pan-American Health Organization (PAHO) to conduct training sessions for the trainers to help them educate the local healthcare professionals to transmit knowledge and skills of management and treatment of cholera. These train-the-trainers programmes were intended to improve the standard of patient-care and to reduce the number of cholera patients dying from severe dehydration. The duo also worked in the field extensively to monitor the effectiveness of the main trainers' guidance to the basic health workers. When they left the country, they left a favourable impression and some very crucial technical guidelines for Haitian health workers and the Haitian people.

Such a response on the part of ICDDR,B to international outbreaks of cholera is not new. In 2010, as a founding partner of WHO's Global Outbreak Alert and Response Network (GOARN), ICDDR,B provided technical assistance to the Pakistan Government in handling a post-flood cholera outbreak—a crisis that affected the lives of more than 20 million people. The five-member team from ICDDR,B jointly worked with the World



Members of the ICDDR,B team of experts working closely with health professionals of other international organisations in the management of cholera patients in Haiti



Health Organization and the Director General of Health Services, Pakistan, to fight cholera with their emergency health relief effort. There, too, ICDDR,B shared its knowledge of cholera management with the Pakistani health professionals as an addition to on-demand treatment of severely-ill cholera patients. In the past, ICDDR,B extended similar technical support to several other nations, such as Zimbabwe, Papua New Guinea, and Zaire.

The appointment of Dr Alejandro Cravioto as chair of the UN panel to investigate the cholera outbreak in Haiti once again underlines the international standing of ICDDR,B when it comes to innovative lifesaving solutions. This adds another remarkable chapter in the history of accomplishments of this organisation and further underscores its commitment to the global humanitarian cause.

The 13th Annual Scientific Conference held successfully

ICDDR,B organised the 13th Annual Scientific Conference (ASCON XIII) from 14 to 17 March 2011 at the Pan Pacific Sonargaon Dhaka. The theme of this year's Conference was *Science to accelerate universal health coverage*. The theme was divided into six sub-themes: Policy and regulatory frameworks; Disease burden and healthcare priorities; Service infrastructure and health workforce; Financing; Measurement, monitoring and health information systems; and Experience in universal health coverage.

Attended by more than 800 participants from 23 countries, this year's ASCON has been the largest of its kind, both in terms of participation and outcome. This get-together of medical scientists, health professionals, researchers, policy-makers, programme managers, and academicians provided a common platform to share their research findings and experiences on various aspects of universal health coverage.

The inauguration ceremony held on 14 March was graced by the presence of Dr Capt (retd) Mozibur Rahman Fakir, Hon'ble State Minister, Ministry of Health and Family Welfare, Government of the People's Republic of Bangladesh, as Chief Guest while Mr Md Humayun Kabir, Secretary to the Ministry, attended the Conference as Special Guest. Professor K Srinath Reddy, President, Public Health Foundation of India and Professor Rehman Sobhan, Chairman, Centre for Policy Dialogue, Bangladesh, presented their keynote speeches in the inaugural ceremony. Professor Reddy spoke on the imperative and opportunity for universal health coverage now in South Asia,

highlighting the strengths and weaknesses of the health systems and their regulatory framework in the region. He discussed and suggested ways how to remove the bottle-necks for ensuring universal health coverage by increasing access of all people to healthcare. Professor Rehman Sobhan spoke on the right to health and life, pin-pointing the legal rights of the people to a healthy life. He indicated that healthy life of people can only be ensured by political will of the governments. He emphasised the need for poverty alleviation through equitable distribution of wealth for ensuring access to healthcare by all sections of the populace.

Both Chief Guest and Special Guest reminisced on the long-standing collaborations between ICDDR,B and the Government of Bangladesh in addressing the health and population problems in the country. They reiterated continued support of the Bangladesh Government to ICDDR,B in the years to come.

The technical sessions of the 13th ASCON included plenary speeches, followed by presentation of abstracts, special symposia, roundtable, fish-bowl and panel discussions, and two workshops on malaria and arsenic-related health problems. In total, 336 abstracts were received and have been presented either orally or as posters. A compilation of these abstracts is available in a 364-page Abstracts Book. The online edition of the book may be seen at: <http://centre.icddr.org/activity/?typeOfActivity=13ASCON>.

Participation of a number of high-profile professionals from home and abroad as presenters, session chairs, or moderators in those



Dr Capt (retd) Mozibur Rahman Fakir, Hon'ble State Minister, Ministry of Health and Family Welfare, Government of Bangladesh, inaugurating the Conference as Chief Guest

technical sessions hallmarked the truly international merit of the Conference. They included key resource-persons from Johns Hopkins University, USA; World Health Organization; UNICEF; World Bank; University of North Carolina, USA; University of Heidelberg, Germany; Sydney University, Australia; University of Melbourne, Australia; University of Cape Town, South Africa; Universidad del Desarrollo de Chile, Chile; Rockefeller Foundation; Erasmus University, The Netherlands; BIRDEM,

Bangladesh; Bangabandhu Sheikh Mujib Medical University, Bangladesh; Dhaka Medical College, Bangladesh; National Heart Foundation of Bangladesh; International Health Policy Program; GIZ, India and Bangladesh; University of Dhaka, Bangladesh; Bangladesh Institute of Health Sciences; Population Council; INAFI Asia and Bangladesh; Ovations Initiative, UK; Institute of Clinical Effectiveness and Health Policy, Argentina; Results for Development, USA; Concern Worldwide; Heartfile, Pakistan; BRAC and its James P Grant School of Public Health, Bangladesh.



Professor Rehman Sobhan and Professor K Srinath Reddy presenting their keynote speeches

In the concluding session held on 17 March, Health Secretary Mr Md Humayun Kabir was the Chief Guest, and Professor Dr Suhrab Ali, Department of Biochemistry, Northern International Medical College, Bangladesh, was the Special Guest. Both are members of the ICDDR,B's Board of Trustees. In his concluding remarks, Dr Alejandro Cravioto, Executive Director of ICDDR,B, who chaired the 13th ASCON Scientific Committee, said: "Having a deep personal commitment to this issue, I was greatly encouraged by the excellent presentations by prominent researchers from around the globe...I would like to acknowledge the hard work of all the people who were involved in this well-organised and meaningful event."

Dr Timothy G Evans, Dean of the James P Grant School of Public Health under BRAC University and one of the Co-Chairs of the 13th ASCON Scientific Committee, presented highlights of the Conference and explained how outcomes from the Conference may help us ensure the desired universal health coverage and achieve the targets of Millennium Development Goals.

The Conference ended with a Vote of Thanks by Dr Abbas Bhuiya, Deputy Executive Director of ICDDR,B and Co-Chair of the 13th ASCON Scientific Committee.

Johns Hopkins University and ICDDR,B: A Proud Partnership

Johns Hopkins University is the very first institution with which ICDDR,B ever collaborated. In fact, all the scientists who played key roles in the internationalisation of the organisation in 1978 were somehow associated with Johns Hopkins University (JHU). Some were faculty members seconded from JHU while others had their academic education and/or training from Johns Hopkins Bloomberg School of Public Health. Dr Willard Foster Verwey, Dr Ken Brown, Dr Robert Gilman, Dr Henry Mosley, Dr David A Sack and Dr WB Greenough III were among the prominent personalities who worked during the transition period.

Collaborative research between ICDDR,B and Johns Hopkins began long before ICDDR,B was internationalised, when Johns Hopkins Bloomberg School of Public Health included diarrhoeal diseases and associated malnutrition in their research agenda of 1977. Later, the research agenda of both JHU and ICDDR,B expanded to encompass a wider range of public health issues, and collaboration between the two institutions strengthened over the years. In addition to collaborative work, JHU has also funded several of ICDDR,B's research projects.

ICDDR,B's collaboration is mostly with the international health faculty at the Johns Hopkins Bloomberg School of Public Health since the School has a longstanding role in combating important childhood diseases through population-based interventions, including vaccine trials.

One of the earliest fruits of the collaboration was the formulation and standardisation of oral rehydration solution (ORS), which involved investigation of the comparative efficacy of sucrose and glucose in the ORS. Following this globally-acclaimed success, the two institutions teamed up in studies to select the right antibiotic for the treatment of severe shigellosis, and a sero-epidemiological surveillance programme of rotavirus diarrhoea in rural Bangladesh.



Johns Hopkins University, established in 1876, remains a world leader in both teaching and research. The main campus is located in Baltimore, Maryland, USA. Academic disciplines range from arts, music and humanities to the social and natural sciences, engineering, international studies, education, business, and the health professions. The university has nine academic divisions and campuses throughout the Baltimore-Washington area. The schools of

Medicine, Public Health, and Nursing share a campus in east Baltimore with the Johns Hopkins Hospital. The Johns Hopkins Bloomberg School of Public Health, established in 1916, is the largest school of public health in the world, with 530 full-time and 620 part-time faculty members. The School hosts more than fifty research centres and institutes, with research ongoing in the USA and more than 90 countries worldwide. The School ranks number 1 in federal research support from the National Institutes of Health (NIH). The mission of the Johns Hopkins University is to educate its students and cultivate their capacity for life-long learning, to foster independent and original research, and to bring the benefits of discovery to the world.

Gradually, the partnership between Johns Hopkins and ICDDR,B expanded and accelerated in various fields of research, such as epidemiology and ecology of cholera in Bangladesh, development of pneumococcal vaccines, development of influenza vaccines, mapping of malaria epidemiology in Bangladesh, Hib initiative, control of chronic disease, respiratory tract infections, hygiene and handwashing, maternal and infant immunisation, making the health system work for the poor, epidemiology of hepatitis E in Bangladesh, discouraging early marriage, and much more.

Johns Hopkins began funding research work at ICDDR,B in 1984 and has continued to fund projects. Of the two most recent grants, one is for an influenza vaccine trial intended to reduce the incidence of pneumonia among children below two years by 10%. The other is for studying the epidemiology and ecology of *V. cholerae* in Bangladesh.

The influenza vaccine trial is significant since pneumonia is the leading cause of child mortality worldwide. In Bangladesh, pneumonia is now the biggest killer of children. Globally, there are urgent calls for appropriate interventions, including vaccines, to reduce the burden of pneumonia. Data from Bangladesh indicate that influenza has a high



incidence rate of over 10% per year among children aged less than 5 years, with children below 2 years of age being the most vulnerable. The vaccine under trial is a trivalent inactivated vaccine (TIV).

The trial is being conducted at ICDDR,B's Kamalapur field site in urban Dhaka. The field office has been maintaining a population-based health surveillance system for over 10 years among nearly 10,000 low-income households. Kamalapur field site has been used since 2004 by both US Centers for Disease Control and Prevention (CDC) and the PneumoADIP project at Johns Hopkins University to identify aetiology of viral and bacterial pneumonia. Reducing pneumonia-related mortality would contribute substantially to achieving the Millennium Development Goal (MDG 4) of reducing child mortality by two-thirds by 2015. Results from the ongoing vaccine efficacy trial, to be concluded by December 2012, will not only benefit Bangladesh, but also other pneumonia-endemic countries in the tropical and sub-tropical belt.

The influenza vaccine trial is just another example of the ongoing collaborations between Johns Hopkins University and ICDDR,B—a long and fruitful partnership of which we are justifiably proud.

Science features ICDDR,B's work on Nipah encephalitis



Photo: J. Epstein

The world-renowned journal *Science*, in its March 4, 2011 Issue (vol. 331), featured ICDDR,B's pioneering work on the recent Nipah encephalitis outbreak in Bangladesh. *Science*, published by the American Association for the Advancement of Science, is one of the world's most-cited scientific journals and covers only groundbreaking research findings. The coverage is indicative of the importance of ICDDR,B's work on this serious health problem in Bangladesh, especially in the central and western part of the country. In 2008, The Discovery Channel also highlighted ICDDR,B's work on Nipah in a television documentary.

The *Science* feature is based on interviews with ICDDR,B scientists and investigators as well as the Director of the Institute of Epidemiology, Disease Control and Research (IEDCR). The ICDDR,B research team for Nipah-related investigations is led by Stephen P. Luby, Head of Infectious Diseases and Vaccine Sciences Programme. Other members of the team include: Ms Emily Gurley, Dr Jahangir Hossain, Ms Rebeca Sultana, and Dr Salah Uddin Khan. They have been involved in almost all investigations and surveillance activities relating to Nipah in Bangladesh. *Science* interviewed most of them and highlighted the aetiology, epidemiology, and prognosis of Nipah encephalitis.

The first outbreak of Nipah encephalitis was reported from Malaysia in 1998 among pigs and pig-handlers. Before detailing ICDDR,B's work on Nipah, the *Science* feature described this first-identified outbreak. The Malaysian public-health authorities first assumed that the disease was swine fever or Japanese encephalitis and that the pigs were the natural reservoir of the virus. Later in 1999, Malaysian scientists, in collaboration with the Centers for Disease Control and Prevention (CDC), USA, isolated the virus and recognized that it was similar to Hendra virus, a virus that had caused fatal outbreaks among horses and people in

Australia and whose natural reservoir is the fruit-bat. Malaysian scientists eventually isolated Nipah virus from fruit-bats of the genus *Pteropus*, which confirmed it as the natural reservoir. The investigations in Malaysia suggested that Nipah virus was passed from bats to pigs probably through bats' dropping, partially-eaten fruits contaminated with saliva into pig pens. When pigs became infected, they passed the infection on to people.

The first outbreak of Nipah encephalitis was recognised in Bangladesh in 2001. ICDDR,B and IEDCR jointly responded to the outbreak on an emergency basis, with technical and financial assistance from CDC. Since that time, Nipah outbreaks have been identified almost every year in Bangladesh. Through a series of collaborative outbreak investigations and surveillance in both people and bats, ICDDR,B scientists, in collaboration with scientists at EcoHealth Alliance, have confirmed that the fruit-bat species *Pteropus giganteus*, commonly known as the Indian fruit-bat, is frequently infected with Nipah virus.

The investigators observed that these outbreaks occurred during January-May, mostly in the central and western part of Bangladesh, when date-palm juice is collected and consumed by the local people. Through systematic epidemiological studies, infrared camera monitoring of bat-feeding and laboratory investigations, the scientists confirmed that the disease was contracted from drinking raw date-palm juice contaminated by the fruit-bat. The juice-collector—locally called *Gachhi* (tree-climber)—cuts a hole onto the tender part of the trunk near its top and draws the juice. The juice then oozes onto an earthen pot. While sipping the tasty juice, the fruit-bats often contaminate it with their saliva—saliva that occasionally contains the Nipah virus. Once people are infected with Nipah virus, they often transmit the infection to other people who take care of them.

Her Royal Highness Princess Anne visits ICDDR,B



On 2 March, Her Royal Highness Princess Anne paid a visit to ICDDR,B during a three-day trip to Bangladesh. Led by Executive Director Dr Alejandro Cravioto, senior representatives of ICDDR,B briefed the Princess on how ICDDR,B is contributing to Bangladesh's push towards achieving the Millennium Development Goals, especially MDG 4 and 5, which seek to reduce child mortality and improve maternal health. While visiting ICDDR,B, Princess Anne was introduced to several senior scientists, including Dr Firdausi Qadri, Head of the Immunology Laboratory and Dr Rubhana Raqib, Head of the Nutritional Biochemistry Laboratory, who showed her the functional aspects of their labs. Dr Stephen P Luby, Head of the Programme for Infectious Diseases and Vaccine Sciences, gave a presentation on water and sanitation, and Dr Tahmeed Ahmed introduced her to the Nutrition Rehabilitation Unit. Accompanied by ICDDR,B's Medical Director Dr Mark Pietroni, Her Royal Highness also visited our Dhaka Hospital and observed the dedicated clinical management system here. Princess Anne expressed admiration for the work of ICDDR,B and enthusiastically

engaged with the scientists, clinicians, and nursing officers whom she met. Out of her deep interest in health and social welfare in the developing countries, she scheduled some visits to other organisations that receive support from the UK, including the Acid Survivors Foundation and Save the Children. The only daughter of Queen Elizabeth II and Prince Philip, the Duke of Edinburgh, Princess Anne is known for her charitable work as a patron of over 200 organisations, including Sense (The National Deafblind Charity), one of the leading national charities in the United Kingdom. The Princess is closely involved in the work of this charity and hosts a number of events to raise money for its continued good work in the community. She is a benefactor of many other concerns that work for the welfare of society. The UK has provided crucial support to ICDDR,B over the years. From scientific collaborations to the generous donations that ICDDR,B has always received from UKaid, the relationship has been a long and fruitful one. The visit of Princess Anne to ICDDR,B underscored the significance of that relationship.

Working with local villagers, ICDDR,B anthropologists adopted a simple technique to physically block bats' access to the date-palm sap, using a bamboo-skirt similar to what villagers use to catch fish. Infrared camera studies confirmed that bamboo-skirts were effective in preventing access of bats to the date-palm sap. In addition to the preventive measures, two low-cost drugs—amiloride and chloroquine—commonly used in the treatment for hypertension and malaria respectively are now under trial, following a report published in *ScienceNOW* in April 2009 that a group of scientists led by Robin Buckland of the French National Institute for Health and Medical Research (INSERM) found these to be effective against Nipah encephalitis.

To help one understand the deadly nature of the virus, Dr Stephen P Luby said to *Science*, "This virus is a bad actor. It causes a striking degree of anxiety and panic...healthy young people die and die in groups...this really is a community crisis."

IEDCR Director Professor Dr Mahmudur Rahman is optimistic that the situation will be brought under control since the Government of Bangladesh is well aware of the consequence if appropriate interventions, including mass education campaign, are not launched. "I believe that we will be able to keep the disease under control", he said. "If we fail, it will be a real disaster for the country."

Along with preventive measures, including discovery of efficacious vaccine(s), scientific search for curative medicines against Nipah encephalitis should now be carried out more seriously, the *Science* feature emphasised. Nipah-carrying fruit-bats are abundantly found in countries of Southeast Asia and the African region. Live Nipah virus has been isolated in Thailand, although no case of infection in humans has been reported from there. Sporadic cases of Nipah encephalitis in humans have been reported from India. Since drinking of raw date-palm juice during the winter months is a traditional practice among the people of this region, Nipah encephalitis may emerge as a major public-health problem leading to recurrent seasonal epidemics. For the development



of preventive vaccine(s), appropriate strain(s) of the virus should first be identified. "We have identified an awful lot of bats that are antibody-positive. It's just a matter of time until we find live virus," Dr Luby said. To explain why the virus doesn't affect bats, he said that they do not seem susceptible to it; it's like *E. coli* in our guts; presumably, the mother's antibodies protect newborn pups from Nipah; when the antibody wanes, they become susceptible.

A full understanding of this biological mechanism in bats may open up avenues for medical scientists to find appropriate ways to induce immunity in humans against Nipah.