Coordinated multi-sectoral approach to sustain health achievements and meeting 21st century public health challenges

13-15 January 2013

Radisson Blu Water Garden Hotel, Dhaka

ABSTRACTS BOOK
Preface

The National Public Health Conference (NPHC) 2013 is a remarkable event in the health domain of our country. Bangladesh has progressed a lot in the last two decades, particularly in health sector. Our Honorable Prime Minister Sheikh Hasina has earned prestigious international honours and recognition for Bangladesh, many of which are in the field of public health. Bangladesh is on track to attain the majority of the health related Millennium Development Goals. Honorable Minister, Ministry of Health & Family Welfare Professor A F M Ruhal Haque is directing us towards the goal of attaining a healthy population.

The Government of the People’s Republic of Bangladesh is highly committed to attain healthy lives of the people of Bangladesh. Though economic development is one of the prerequisites for attaining good health for a nation and vice versa, but without a robust public health system, health for every citizen cannot be ensured. Bangladesh is working in this direction.

The main theme “Coordinated multi-sectoral approach to sustain health achievements and meeting 21st century public health challenges” will be focused throughout the Conference. The inaugural ceremony will be adorned by eminent dignitaries of health arena. The public health scientists and managers will discuss elaborately on the four thematic areas in the scientific sessions for two days. We hope that this Conference will bring forward the innovative success stories of Bangladesh in this field, which will form the scientific evidence-base for the committed public health workforce.

We thank all those who were instrumental for the inception, planning, implementation and success of the Conference. We acknowledge the contribution of World Health Organization (WHO) Bangladesh Country Office, which strengthened the effort of the Ministry of Health & Family Welfare for organizing the Conference.

Steering Committee
National Public Health Conference 2013
Dhaka
# Table of contents

<table>
<thead>
<tr>
<th>Committees</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering Committee</td>
<td>v</td>
</tr>
<tr>
<td>Organizing Committee</td>
<td>vi</td>
</tr>
<tr>
<td>Scientific Committee</td>
<td>vi</td>
</tr>
<tr>
<td>Panel of Reviewers</td>
<td>vii</td>
</tr>
</tbody>
</table>

## Conference Schedule

<table>
<thead>
<tr>
<th>Event</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inaugural ceremony (January 13, 2013)</td>
<td>viii</td>
</tr>
<tr>
<td>Thematic and scientific sessions 1 &amp; 2 Day 1 (January 14, 2013)</td>
<td>ix</td>
</tr>
<tr>
<td>Thematic and scientific sessions 3 &amp; 4 Day 2 (January 15, 2013)</td>
<td>xi</td>
</tr>
</tbody>
</table>

## Key Note Speech

**Health in Bangladesh: Impressive progress and daunting challenges**

Abbas Bhuiya, Ph.D, Interim Executive Director & Deputy Executive Director, icddr,b

## Abstracts:

### Scientific Session 1:

- **Health ecology and its potential challenges in Bangladesh by 2050 (50)**
  M Shafiqu Rahman, DGHS.

- **Developing first responder training programme to prevent child drowning in a rural community in Bangladesh: Is it feasible? (43)**
  Syed Jahangir Hussain, CIPRB.

- **Revitalizing Health for All: Developing a comprehensive primary health care model for Bangladesh (37)**
  Taufique Joarder, JPGSPH.

- **Cost-effectiveness of an injury and drowning prevention program in Bangladesh (42)**
  Aminur Rahman, CIPRB.

- **An analysis of verbal autopsies in 305 maternal deaths captured by maternal and perinatal death review system in 4 districts of Bangladesh. (46)**
  Abdul Halim, CIPRB.

- **Opportunities and challenges in strengthening health system to improve maternal care: Insights from a stakeholder analysis. (48)**
  Mohammad Iqbal, icddr,b.

### Scientific Session 2:

- **UN REACH in Bangladesh: facilitating multisectoral coordination for nutrition (49)**
  Mary Manandhar, UN REACH Bangladesh Country Team.

- **One Health, shared responsibility (01)**
  Shamim Ahmed, WaterAid.

- **Serological evidence of hepatitis E virus in pigs and the history of jaundice among pig handlers in Bangladesh (23)**
  Suman Kumer Paul, icddr,b.
Table of contents

HPAI at the human-birds (wild and domestic) interface, as well as drug residues and resistances in animals attribute public health threats (57)
M A Hoque, CVASU.

Campylobacter infection in Danish meat producing chickens (broilers): Spatial analysis and neighbourhood risk factors. (58)
Sharmin Chowdhury, CVASU.

One Health approach to curb zoonoses: Bangladesh scenario (55)
M Mushtuq Husain, IEDCR.

An entomological investigation of the first chikungunya outbreak in Bangladesh. (41)
Nuzhat Nasreen Banu, IEDCR

Scientific Session 3:

Etiologic studies of patients visiting different diarrheal disease facilities in Bangladesh (03)
A S G Faruque, icddr,b.

Role of support person presence during delivery to increase exclusive breast feeding prevalence in rural, Bangladesh (14)
Aminur Rahman, icddr,b.

Improving public health education: Lessons learned and moving forward (56)
Sabina Faiz Rashid, JPGSPH.

Experience from community based childhood burn prevention programme in Bangladesh: Implication for low resource setting (31)
S R Mashreky, CIPRB.

Relative efficacy of two regimens to control soil transmitted infections among poor pre-school children in Bangladesh (52)
Masud Alam, icddr,b.

Social autopsy - A social intervention to aware community on maternal and neonatal deaths in Bangladesh (51)
Animesh Biswas, CIPRB.

Scientific Session 4:

Mass sociogenic illness in a school feeding program in northwest Bangladesh (32)
Farhana Haque, IEDCR & icddr,b.

Seasonal variations in the etiology of major diarrheal pathogens in different geographical areas in Bangladesh (06)
Sumon Kumar Das, icddr,b.

Risk factors of non-fatal drowning among rural children up to five years of age (13)
Syed Abul Hassan Md Abdullah, AMC.
Table of contents

Types and determinants of anemia in Bangladeshi type 2 diabetics (19) Farzana Rahman, BUHS.  
Alcohol consumption in adult Saontal women (17) Monalisa, IEDCR.  
Sero-conversion in chronic hepatitis B infection after treatment (26) S M Solaiman, AMC.  

Poster Presentations:  

Day One:  
Zoonotic parasites of the pigs of Bangladesh. (24) Ausraful Islam, Bangladesh Agricultural University and icddr,b.  
Bangladeshi agricultural workers’ pesticide use practices and awareness and experience with toxicity symptoms. (25) Pritimoy Das, icddr,b  
Low prevalence of Leishmania donovani infection among the blood donors in kalaazar endemic areas of Bangladesh (02) M. Mamun Huda, icddr,b  
Emergence of Shigella sonnei sero-groups in Bangladesh: observations from four different diarrheal disease health facilities (04) Abu Syed Golam Faruque, icddr,b  
Comparison of clinical and laboratory characteristics of intestinal amoebiasis with shigellosis among patients visiting a large urban diarrheal disease hospital in Bangladesh (05) Sumon Kumar Das, Icddr,b  
Disease severity and common aetiology of diarrhoea among under-five children in Mirzapur of rural Bangladesh (08) Shahnawaz Ahmed, icddr,b  
Severity of diarrhoea and its association with malnutrition among under-five children in rural Bangladesh (11) Farzana Ferdous, Icddr,b  
Studies on antimicrobial activity of Perionyx excavatus extract against responsible pathogen (Group A β-haemolytic streptococcus) for Rheumatic fever in perspective of Bangladesh (40) Md. Sarwar Jahan, Rajshahi University  
Success and challenges of tuberculosis control in Bangladesh (21) Husain M A, NTP, DGHS
# Table of contents

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A step forward to combat medication errors (30)</td>
<td>37</td>
</tr>
<tr>
<td>Arif Mahmud. Apollo Hospital</td>
<td></td>
</tr>
<tr>
<td>Antioxidants in combating morbidities among underprivileged preschool children (12)</td>
<td>45</td>
</tr>
<tr>
<td>Sarder Mahmud Hossain, Northern University Bangladesh</td>
<td></td>
</tr>
</tbody>
</table>

**Day Two:**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using online social networks for increasing health literacy on oral health (22)</td>
<td>39</td>
</tr>
<tr>
<td>Ziauddin Ahmed, BUHS, DU</td>
<td></td>
</tr>
<tr>
<td>Knowledge regarding adiposity in urban adolescent students (28)</td>
<td>40</td>
</tr>
<tr>
<td>SN Jahan, Shaheed Suhrawardy Medical College</td>
<td></td>
</tr>
<tr>
<td>Hand washing knowledge and practices among school children in Bangladesh (34)</td>
<td>41</td>
</tr>
<tr>
<td>Bilkis Banu, BUHS</td>
<td></td>
</tr>
<tr>
<td>A comparative study on the infant and young child feeding practice and nutrition status among 0-23 months age group children in nutrition intervention and non-intervention area (36)</td>
<td>42</td>
</tr>
<tr>
<td>Taslima Khatun, BUHS</td>
<td></td>
</tr>
<tr>
<td>Feeding pattern and nutritional status of under two years slum children(36)</td>
<td>43</td>
</tr>
<tr>
<td>Khursheda Akhtar, Shaheed Suhrawardy Medical College</td>
<td></td>
</tr>
<tr>
<td>Nutritional status among primary school children in Sreepur Upazila under Gazipur District (47)</td>
<td>44</td>
</tr>
<tr>
<td>Adhikary M, Dhaka Medical College</td>
<td></td>
</tr>
<tr>
<td>Insufficiency of drainage and sanitation system of Rajshahi city: Impacts on human health (44)</td>
<td>38</td>
</tr>
<tr>
<td>Md. Moshiur Rahman, Rajshahi University</td>
<td></td>
</tr>
<tr>
<td>Nutritional status of children aged 5-14 years in selected arsenic exposed and non-exposed areas in Bangladesh (15)</td>
<td>46</td>
</tr>
<tr>
<td>M.R. Karim, NIPSOM</td>
<td></td>
</tr>
<tr>
<td>Study on knowledge of bronchial asthma and assessment of airway condition by peak flow meter in a rural community in Bangladesh (38)</td>
<td>47</td>
</tr>
<tr>
<td>SM Rowshan Alam, Rangpur Medical College</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular risk factors among type 2 diabetic subjects attending selected diabetes care facilities in Bangladesh (18)</td>
<td>48</td>
</tr>
<tr>
<td>Farzana Saleh, BUHS</td>
<td></td>
</tr>
<tr>
<td>Metabolic syndrome in Bangladesh using NCEP Adult Treatment Panel III criteria (54)</td>
<td>49</td>
</tr>
<tr>
<td>Syed Muhammad Baqui Billah, SBMC</td>
<td></td>
</tr>
</tbody>
</table>

**List of Authors**

50
Conference committees

Steering Committee: (Not in order of seniority)

Chair Person:
Mr A M Badrudduja, Additional secretary, Ministry of Health & Family Welfare

Members:
Professor Dr Khandhaker Md Shefyetullah, Director General of Health Services
Mr A K M Amir Hossain, Director General of Family Planning
Mr Md. Asadul Islam, Joint Secretary (Admin), Ministry of Health & Family Welfare
Mr Subhash Chandra Sarker, Joint Secretary (Public Health), Ministry of Health & Family Welfare
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Professor Dr Abul Kalam Azad, Additional Director General (Planning), Directorate General of Health Services
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Professor Dr M Iqbal Arslan, Dean, Basic Medical Science, BSMMU; Secretary General, Bangladesh Medical Association
Professor Be-Nazir Ahmed, Director, Disease Control, Directorate General of Health Services
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Dr S A J M Musa, Director, Primary Health Care, Directorate General of Health Services
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Professor Mahmudur Rahman PhD, Director, IEDCR
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- Professor Dr Shaila Hossain, NIPSOM
- Professor Meerjady Sabrina Flora, NIPSOM
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- Dr M Sabbir Haider, IEDCR
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- Dr Abdullah Al Kawsar, IEDCR
- Dr Shamim Jubayer, IEDCR
- Dr Md. Tarique Mehedi Parvez, Bangladesh Red Crescent Society
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Professor Shahina Tabassum
Professor Sanya Tahmina
Dr Mat Yamage
Professor Sharmeen Yasmeen
Dr M Mostafa Zaman

Members of Working Team:
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Dr Zakia Alam
Dr Monalisa
Dr Mostafizur Rahman
Shamsi Ara Chowdhury
Conference Schedule

Inaugural Ceremony

13 January 2013, Sunday, 6:30 PM;
Grand Ball Room, Radisson Blu Water Garden Hotel, Dhaka.

Theme: **Coordinated multi-sectoral approach to sustain health achievements and meeting 21st century public health challenges**

- **18:30** Arrival of the guests
- **18:35** Recitation from the Holy Qur’aan
- **18:40** Welcome Address by **Mr A M Badrudduja**
  - Additional Secretary, MoHFW
  - Chair, Conference Steering Committee
- **18:50** Key note presentation by **Dr Abbas Bhuiya**
  - Interim Executive Director, icddr,b
- **19:30** Address by the Special Guest **Professor Dr Khandhaker Md Shefyetullah**
  - Director General, DGHS, Ministry of Health & Family Welfare
- **19:30** Address by the Special Guest **Professor Pran Gopal Dutta**
  - Vice Chancellor, Bangabandhu Sheikh Mujib Medical University (BSMMU)
- **19:30** Address by the Special Guest **Prof M Iqbal Arslan**
  - Secretary General, Bangladesh Medical Association
- **19:30** Address by the Special Guest **Dr Samlee Plianbangchang**
  - Regional Director, WHO SEARO
- **19:30** Address by the Special Guest **Dr Capt (Rtd) Mozibur Rahman Fakir M.P.**
  - Hon’ble State Minister, Ministry of Health & Family Welfare
- **19:30** Address by the Special Guest **Professor Dr Syed Modasser Ali**
  - Hon’ble Adviser to Prime Minister, Health & Family Welfare, and Social Welfare
- **20:15** Address by the Chief Guest **Professor A F M Ruhal Haque M.P.**
  - Hon’ble Minister, Ministry of Health & Family Welfare
- **20:30** Address by the Chair **Mr. Md. Humayun Kabir**
  - Senior Secretary, Ministry of Health & Family Welfare
- **20:40** Vote of thanks by **Professor Mahmudur Rahman PhD**
  - Member Secretary, Steering Committee
- **20:45** Dinner
Scientific Sessions:

14 January 2013 Monday, Utshab Hall, Radisson Blu Water Garden Hotel, Dhaka

Theme 1: Institutionalizing public health programs, policy and planning

Thematic Session 1

Chair: Dr Thushara Eraj Indranath Fernando, WHO Representative, Bangladesh
Co-Chair: Dr S A J M Musa, Director, PHC, DGHS
Rapporteurs: Dr Khaleda Islam, IEDCR
Dr Muhammad Waliur Rahman, IEDCR
Co-ordinators: Dr Mujaddeed Ahmed, WHO
Dr M Sabbir Haider, IEDCR

09:00-09:15 Public health priorities in National Health Policy, Population Policy & HPNSDP
Mr Md Humayun Kabir, Senior Secretary, MoHFW

09:15-09:30 Universal Health Coverage; highlights of healthcare financing strategy
Mr Asadul Islam, Joint Secretary (Admin), MoHFW

09:30-09:45 Pro-people Health Initiative in Rural Bangladesh
Dr Makhduma Nargis, Additional Secretary & Project Director, RCHIB

09:45-10:00 Food Safety & Quality Policy
Professor Shah Monir Hossain, Senior Advisor, FAO

10:00-10:30 Discussion

10:30-11:00 Tea Break

Scientific Session 1

Chair: Professor A F M Saiful Islam, ADG, DGHS
Co-Chair: Gregory Adams, Director, Office of Population, Health and Nutrition, USAID

11:00-11:10 Health Ecology and its Potential Challenges in Bangladesh by 2050
M Shafiqur Rahman, DGHS.

11:10-11:20 Developing first responder training programme to prevent child drowning in a rural community in Bangladesh: is it feasible?
Syed Jahangir Hussain, CIPRB.

11:20-11:30 Revitalizing Health for All: Developing a Comprehensive Primary Health Care Model for Bangladesh
Taufique Joarder, JPGSPH.

11:30-11:40 Cost-Effectiveness of an Injury and Drowning Prevention Program in Bangladesh.
Aminur Rahman, CIPRB.

Abdul Halim, CIPRB.
Opportunities and challenges in strengthening health system to improve maternal care: Insights from a stakeholder analysis.
Mohammad Iqbal, icddr,b.

Discussion

Poster Presentation

Lunch

Theme 2: Multi-sector coordination & One Health approach

Thematic Session 2

Chair: Dr Shamsul Alam, Member, Planning Commission
Co-Chair: Dr James Heffelfinger, CDC Bangladesh Country Office
Rapporteurs: Dr Mujaddeed Ahmed, WHO
Dr M Sabbir Haider, IEDCR
Co-ordinators: Dr Selina Khatun, WHO
Dr Monalisa, IEDCR

Multisectoral involvement in implementation of International Health Regulation (IHR) 2005
Professor Be-Nazir Ahmed, Director, Disease Control, DGHS

One Health initiative in Bangladesh
Professor Nitish C. Debnath, National Consultant, FAO

Significance and implication of proposed Urban Health Strategy
Mr Swapan Kumar Sarker, Additional Secretary & DG, Planning, Monitoring & Evaluation, Local Government Division, MoLGRDC

Field Epidemiology Training Programme, Bangladesh
Shua J Chai, US CDC & Resident Adviser, FETP,B

Discussion

Afternoon Tea

Scientific Session 2:

Chair: Dr Lianne Kuppens, Chief of Health, UNICEF
Co-Chair: Professor Saroj Kumar Mazumder, Director NIPSOM

UN REACH in Bangladesh: facilitating multisectoral coordination for nutrition
Mary Manandhar, UN REACH Bangladesh Country Team

One Health, Shared Responsibility
Shamim Ahmed, WaterAid

Serological evidence of Hepatitis E Virus in pigs and the history of jaundice among pig handlers in Bangladesh
Suman Kumer Paul, icddr,b

HPAI at the human-birds (wild and domestic) interface, as well as drug residues and resistances in animals attribute public health threats
M. A. Hoque, CVASU
16:40-16:50  *Campylobacter infection in Danish meat producing chickens (broilers): spatial analysis and neighbourhood risk factors.*
Sharmin Chowdhury, CVASU

16:50-17:00  *One Health approach: Bangladesh scenario*
M Mushtuq Husain, IEDCR

17:00-17:10  *An entomological investigation of the first chikungunya outbreak in Bangladesh.*
Nuzhat Nasreen Banu, IEDCR

17:10-17:30  Discussion

15 January 2013 Tuesday, Utshab Hall, Radisson Blu Water Garden Hotel, Dhaka

Theme 3: **Evidence based best practices in public health education & service delivery**

**Thematic Session 3**

Chair:  Professor Sadiqa Tahera Khanam, Former Director NIPSOM
Co-Chair:  Professor Shah Abdul Latif, Director, Medical Education, DGHS
Rapporteurs:  Dr Selina Khatun, WHO
               Dr Mostafizur Rahman, IEDCR
Co-ordinators:  Dr Khaleda Islam, IEDCR
               Dr Muhammad Waliur Rahman, IEDCR

9:00-9:15  *Water management for a healthy Bangladesh: The need for multi-sector collaboration*
Stephen P Luby, Professor of Medicine, Stanford University

9:15-9:30  *Public Health in the Global Commission Report on HPE*
Timothy G Evans, Dean, JHSPH

9:30-9:45  *Harmonizing public health education: Regional perspective*
Sultana Khanum, SUN Global Civil Society Network

9:45-10:00  *Country scenario in public health education and challenges*
Professor Saroj Kumar Mazumder, Director NIPSOM

10:00-10:15  *Achievements and Challenges of Family Planning in Bangladesh*
Shelina Afroz PhD, DG, NIPORT

10:15-10:30  *Success Stories of Immunization Programme in Bangladesh*
Tajul Islam A Bari, Programme Manager EPI, DGHS

10:30-10:45  Discussion
10:45-11:00  Morning Tea
Scientific Session 3

Chair: Professor Mamunar Rashid, Principal, Ibrahim Medical College
Co-Chair: Professor Be-Nazir Ahmed, Director, Disease Control, DGHS

11:00-11:10 Etiologic studies of patients visiting different diarrheal disease facilities in Bangladesh
A S G Faruque, icddr,b.

11:10-11:20 Role of support person presence during delivery to increase exclusive breast feeding prevalence in rural, Bangladesh
Aminur Rahman, icddr,b.

11:20-11:30 Improving Public Health Education: Lessons Learned and Moving Forward
Sabina Faiz Rashid, JPGSPH.

11:30-11:40 Experience from community based childhood burn prevention programme in Bangladesh: Implication for low resource setting
S R Mashrekty, CIPRB.

11:40-11:50 Relative efficacy of two regimens to control soil transmitted infections among poor pre-school children in Bangladesh
Masud Alam, icddrb.

11:50-12:00 Social autopsy- A social intervention to aware community on maternal and neonatal deaths in Bangladesh
Animesh Biswas, CIPRB.

12:00-12:10 Value for Volunteers: is there a free lunch? Experiences from Chakaria Community Health Project (CCHP)
Dr Tanvir Ahmed, icddr,b

12:10-12:30 Discussion

12:30-13:00 Poster Presentation

13:00-14:00 Lunch

Theme 4: Demographics and disease pattern

Thematic Session 4:

Chair: Professor Abul Kalam Azad, ADG, DGHS
Co-Chair: Dr Abu Jamil Faisel, Country Representative for Bangladesh, Engender Health
Rapporteurs: Dr Ashraful Alam, IEDCR
Dr Sazzad Hossain Shovon, icddr,b

Co-ordinators: Dr Asif Mujtaba Mahmud, IEDCR
Nuzhat Nasreen Banu, IEDCR

14:00-14:15 Demographic trends in Bangladesh
Professor AKM Nurun Nabi, Dept of Population Sciences, University of Dhaka

14:15-14:30 Trends in Non-Communicable Diseases
M Mostafa Zaman, NPO (NCD) WHO
14:30-13:45  *Road accidents and injury prevention*  
Fazlur Rahman, Executive Director, CIPRB  

14:45-15:00  *Nutrition & Public health*  
Tahmeed Ahmed, Director, CNFS, icddr,b  

15:00-15:15  *Micronutrient deficiency disease status & public health implication*  
Zeba Mahmud, Director, Micronutrient Initiative Bangladesh Country Office  

14:15-15:30  *Disease Surveillance to protect human health from adverse effect of Climate Change*  
Peter Kim Streatfield, Head, Urbanization & Climate Change, icddr,b  

15:30-15:40  Discussion  

15:40-16:00  Afternoon Tea  

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**Scientific Session 4:**  

Chair: Mr A M Badrudduja, Additional Secretary, MoHFW  
Co-Chair: Professor Mahmudur Rahman PhD, Director, IEDCR  

4:00-4:10  *Mass sociogenic illness in a school feeding program in northwest Bangladesh*  
Farhana Haque, IEDCR & icddr,b.  

4:10-4:20  *Seasonal variations in the etiology of major diarrheal pathogens in different geographical areas in Bangladesh*  
Sumon Kumar Das, icddr,b.  

4:20-4:30  *Risk Factors of Non-fatal Drowning among Rural Children up to Five Years of Age*  
Syed Abul Hassan Md Abdullah, AMC.  

4:30-4:40  *Types and determinants of anemia in Bangladeshi type 2 diabetic subjects.*  
Farzana Rahman, BUHS.  

4:40-4:50  *Alcohol consumption in adult Saontal women*  
Monalisa, IEDCR.  

4:50-5:00  *Sero-conversion in chronic hepatitis B infection after treatment*  
S M Solaiman, AMC.  

5:00-5:30  Discussion
Key-note Speech

Health in Bangladesh: Impressive Progress and Daunting Challenges

Abbas Bhuiya, Ph.D
Interim Executive Director & Deputy Executive Director, icddr,b

Bangladesh has made significant progress in raising life expectancy, a summary indicator for population health, over the past few decades. A child born in Bangladesh today can expect to live around 70 years on average, nearly double of what he or she could expect to live if born 55–60 years ago. Apart from advancements in medicine, the gain in life expectancy, which has been increasing steadily since the mid-1980s, is an outcome of successful, large-scale public health and development programmes such as immunization and the management of diarrheal diseases with oral rehydration therapy. Poverty alleviation and social development programmes such as microfinance and female education have also contributed to increased life expectancy in Bangladesh.

The reduction in Bangladesh’s total fertility rate has also been quite notable. In the early 1970s the fertility rate of 6.3 children per woman of reproductive age decreased to 2.3 children in 2009–11. The state-run family planning program has been a success, with a contraceptive prevalence rate of 61% in 2011—nearly eightfold increase from 8% in the mid-1970s.

By contrast, improvement in the nutrition sector has been slow. Although the country has made significant improvements in reducing the prevalence of severe undernutrition among children in the last twenty years, moderate under nutrition remains a pervasive problem. Nearly half of all children below five years of age are either underweight or stunted, with large disparities between genders, geographical regions, and economic groups.

The country also made tremendous progress in the control of TB in terms of notification of new smear-positive cases and treatment success rate. However, multi-drug resistance TB (MDR-TB) will be a major challenge in the future.

Bangladesh appears to be on track to achieving the primary target of MDG 5. Maternal mortality declined from 322 in 2001 to 194 in 2010, a 40% decline in 9 years. The rate of decline was at an average of about 5.5% per year, compared to the average annual rate of reduction of 5.4% required for achieving MDG 5. The progress in maternal health has been somewhat slow with extremely inequitable utilization of safe delivery services in general.
Despite significant advancements in the prevention and treatment of communicable diseases several diseases have the potential to emerge and remerge. The outbreak of an influenza strain, such as H1N1, and the situation of HIV/AIDS and TB can still be an issue of concern for the nation.

While impressive progress has been made so far, the future Bangladesh has to deal with many health challenges some of which have started to emerge and some are likely to be emerging. Transition from the dominance of the burden of communicable diseases to non-communicable diseases is one of the most important ones. Shortage of trained health human resource, issues around healthcare financing and socioeconomic inequity in health and quality healthcare access are some of the major issues facing the nation. Future Bangladesh has to find ways to deal with these challenges to maximize the attainment of development potential the nation has.
Abstract # 50

Health Ecology and its Potential Challenges in Bangladesh by 2050

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Introduction: Health ecology is one of the many dynamic systems in nature that requires nurture. It is the interplay of POET (Population, Organization, Environment and Technology) Complex. Assuming continued current trend in some of the sub-components of POET Complex as climate change, urbanization, human life expectancy and fertility in Bangladesh, a projection into 2050 is reflected in the article.

Objective: Alerting the state and non-state parties, as well as civil societies, on their responsibilities towards positive changes by averting perceived challenges in health ecology.

Method: Consultation of electronic recorded communication for conceptual analysis.

Results: Effects of temperature rise may lead to sea level rise inundating 10% of the 147,570 square kilometers of land mass of Bangladesh, including 84% of Sundarbans, and making 40 million people environmental refugees by 2050. Storm surge with 10% increase in wind speed are expected. Increase in flooding may lead to agricultural loss by 2%. Increased salinity may create an environment that nurtures cholera microorganism, increasing diarrheal diseases and loss of productive hours. Uptrend in life expectancy may lead to an estimated population of 300 million by 2050 in spite of declining fertility rate. Bangladesh has been experiencing rapid urbanization in recent decades compared to rate of growth of rural population.

Conclusion: It is speculated that ecological changes in Bangladesh will bring in its wake modifications in biodiversity, agriculture, infrastructure. Issues of health may emerge as the leading challenge to survival. Other challenges may take the form of providing accommodation for the swollen population in limited space, producing crops in diminished land area, tackling the burden of aging population, and sustaining forests as nature’s lung. Meeting the potential health challenges on a global scale will call for concerted rigorous efforts of people from all disciplines among governments, non-governmental organizations, groups and individuals upholding the need of ‘one for all and all for one’.
Abstract # 43

Developing first responder training programme to prevent child drowning in a rural community in Bangladesh: Is it feasible?

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Introduction: Drowning is the leading cause of death in children aged 1-17 in Asia including Bangladesh. In high income countries (HICs) many drowning victims survive till hospitalisation and studies suggest that victims are more likely to survive following early bystander CPR. In LMICs including Bangladesh drowning victims almost never receive immediate life support as both the bystander and EMS concepts are non-existent. As a result when drowning victims are brought to hospitals in most of the cases they are already dead by that time. Considering this situation this study was designed to develop and implement a first response training programme in Bangladesh.

Objectives: To develop and implement a first responder training programme, assess the feasibility to train lay persons with low literacy in the rural communities in Bangladesh, and to explore the acceptability of the training programme in the community.

Methods: A context-appropriate first responder training programme including cardiopulmonary resuscitation (CPR) was developed and community people of 20 villages in Raiganj, Bangladesh were trained over a 14 month period. The programme was evaluated through post-training assessment of the participants’ knowledge and skills and trainers’ performance evaluation. Focus group discussion (FGD) was conducted to explore community leaders’ response to the training programme.

Results: The first responder training programme including CPR was established in Raiganj. The materials developed for the training include – First Responder Training Manual, posters and a training video. Among all participants 88% qualified post training assessment. The passing rates in adolescents and community volunteers were higher than the community leaders. Among the participants who were re-tested three months after training, more than three-quarters could retain most of the skills of CPR. The FGD revealed that the community leaders considered the training program useful for the community and they expressed their intention to support the programme.

Conclusion: Developing a first responder training programme comprising CPR, in a rural community of Bangladesh with low literacy rate, is feasible. The adolescents and young adults should be targeted as potential candidates for being first responders. By utilizing context-appropriate training programs community people in Rural Bangladesh and in similar low resource settings could achieve the competencies of a first responder.
Revitalizing Health for All: Developing a Comprehensive Primary Health Care Model for Bangladesh

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Introduction: The study aimed at developing a comprehensive primary health care (CPHC) model appropriate in Bangladeshi context. The CPHC team adopted, based on literature review and suggestions from the key informants (KI), an inclusive definition of CPHC which assimilates the demands of the present time with the original Alma Ata principles. CPHC has been defined here as a package or set of activities that: (1) contains a minimum of 8 core activities mentioned in Alma Ata declaration; (2) ensures an effective referral system; and (3) considers principles of promotive, preventive, curative and rehabilitative service, equity, appropriate technology, intersectoral collaboration, devolution (instead of 'decentralization'), and community empowerment (instead of 'community participation').

Methodology: The mixed method research, conducted during the period of June-December 2009, included 3 distinct phases. The first phase involved KI interviews and document reviews to define CPHC, and to document the historical evolution of primary health care (PHC) in Bangladesh. In the second phase a screening survey was conducted in 20 Upazila Health Complexes (UHC) to identify the highest and the lowest performing ones. In the third phase in-depth study was carried out in those UHCs and their catchment areas to better understand their nature of service delivery and to listen to the respondents' suggestions for improvement.

Results: The study found that the UHCs were being used mainly by the patients from lowest income quintile, and the males (58.6%). In terms of community empowerment only the 'access to information' was satisfactory. There was no means to make complaints or to hold service providers accountable; and complaints were not taken into account. Doctors saw private patients taking fee during office time. Service providers demanded more local authority. KIs suggested the health workers to move beyond passive education to be more responsive to community empowerment issues. The study also found the ineffective nature of vertical programs, limited inclusion of nutrition activities, and the failure of top down decision making. Dichotomy of health and family planning sectors was found to be wasteful and confusing to the service seekers.

Conclusion: The findings can be useful for policy makers to decide which areas of health system to emphasize in attaining a comprehensive PHC.
Abstract # 42

Cost-Effectiveness of an Injury and Drowning Prevention Program in Bangladesh

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Introduction: Interventions that mitigate drowning risk in developing countries are needed. This study presents the cost-effectiveness of a low-cost, scalable injury and drowning prevention program called Prevention of Child Injuries through Social-Intervention and Education (PRECISE) in Bangladesh.

Objective: To evaluate the cost-effectiveness of PRECISE program for drowning prevention in Bangladesh.

METHODS: Between 2006 and 2010, the 2 components of PRECISE (Anchal, which sequestered children in crèches [n=18,596 participants], and SwimSafe, which taught children how to swim [n=79,421 participants]) were implemented in rural Bangladesh. Mortality rates for participants were compared against a matched sample of nonparticipants in a retrospective cohort analysis. Effectiveness was calculated via Cox proportional hazard analysis. Cost-effectiveness was estimated according to World Health Organization–CHOosing Interventions that are Cost Effective (WHO-CHOICE) guidelines.

RESULTS: Anchal costs between $50.74 and $60.50 per child per year. SwimSafe costs $13.46 per child. For Anchal participants, the relative risk of a drowning death was 0.181 (p=0.004). The relative risk of all cause mortality was 0.56 (p=0.001). For SwimSafe, the relative risk of a drowning death was 0.072 (p<0.0001). The relative risk of all-cause mortality was 0.750 (p=0.024). For Anchal, the cost per disability adjusted life-year (DALY) averted was $812 (95% confidence interval: $589–$1777). For SwimSafe, the cost per DALY averted was $85 ($51–$561). Combined, the cost per DALY averted was $362 ($232–$1364).

CONCLUSIONS: Based on World Health Organization criteria, PRECISE is very cost-effective and should be considered for implementation in other areas where drowning is a significant problem.
Abstract # 46

**An analysis of verbal autopsies in 305 maternal deaths captured by maternal and perinatal death review system in 4 districts of Bangladesh**

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**Introduction:** The Government of Bangladesh with the technical support of CIPRB, a centre for injury prevention, health development and research, Bangladesh has been implementing Maternal and Perinatal Death Review (MPDR) in four rural districts of Bangladesh since 2010.

**Objective:** To notify maternal and perinatal deaths and cross examine the causal factors for making appropriate remedial actions to reduce maternal and perinatal deaths.

**Methodology:** An MPDR scheme with necessary tools were developed in participatory process and refined by field test. Over 4401 health workers at government and NGO sectors were trained on death notification and verbal autopsy. Verbal autopsies were conducted by the grass root level health workers using field tested questionnaire in 252 maternal deaths occurred in 2011. The data was analysed using SPSS soft ware.

**Results:** MPDR system notified 306 maternal deaths from the community of the four districts: Thakurgaon, Jamalpur, Narial and Moulvibazar in 2011. The mean age of deceased mothers was 23.1±6.5 years, 12.3% were adolescents and 65.9% were < 30 yrs.30% of deceased had parity 1, 43% had parity 2-3 and rest 22% had 4 or more. 14.6% deaths occurred in antenatal, 31% during labour or within 1 hour of delivery and 54.4% in postnatal period. Verbal autopsies revealed the causes of deaths: APH (6.5%), PPH (37.7%), Preeclampsia-eclampsia (19.1%), Caesarean section complications (11.6%), abortion (5.6%) undetermined (4.2%) and others (8.2%). 27.4% died at home, 53.2% at facilities and 17.3% on way. 54% of the deceased received any type of treatment at facility within half hour. The MPDR findings on socio-demographic data revealed the current medical and social dynamics in relation to maternal deaths were utilized in planning remedial actions at local level with success by the health system.

**Conclusion:** An ongoing MPDR system provided numerical estimates on maternal deaths through death notification by geographic areas. Verbal autopsies identified the causal factors -medical or social for the maternal deaths. The data sensitized and helped the health system for preparing specific remedial actions. MPDR – a research based health system intervention could be useful and effective way for reduction of the maternal mortality in Bangladesh.
Abstract # 48

**Opportunities and challenges in strengthening health system to improve maternal care: Insights from a stakeholder analysis**

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**Introduction:** Although Bangladesh has made remarkable progress for achieving targets of MDG 4 and MDG 5, maternal mortality and neonatal mortality in Bangladesh remains high. For reduction of maternal and neonatal mortality, the joint GoB-UN has undertaken district-level Maternal Neonatal Health Initiative (MNHI) project. Stakeholder analysis in MNHI project helps to identify key players in the health sector who can drive, support or hinder the service delivery system. The stakeholder analysis is also useful because it gives an idea of different stakeholders’ interest (stakes), knowledge, level of power and alliance.

**Objectives:** The study aimed to identify stakeholders at national, district, sub-district and community level, determined their interest, fear and expectation about MNHI project assessed their power, influence, agreement and position and finally identify the engagement strategies of stakeholders.

**Methods:** Purposive sampling was used to identify key actors. A total 72 interviews were conducted in between July to September 2012. The study areas were in Dhaka, Jamalpur, Thakurgaon and Moulovibazar.

**Results:** National level stakeholders were found as drivers in MNHI project. Drivers, supporters and bystanders were identified at district and sub-district level. Supporters and bystanders emerged from community level. No blockers were found in MNHI project. The main challenges for effective implementation of MNHI project were the short duration of posting of GoB managers, lack of coordination between UN organisations, delayed fund disbursement and weak inter-sectorial collaboration in between DG Health and DG Family Planning. The integration of local government representatives was not adequate. The engagements strategies of stakeholder analysis were to involve actively, who were the drivers in MNHI project. Collaboration was essential for supporters and abstainers. Finally, bystanders needed to be monitored.

**Conclusion:** Stakeholder analysis contributed to health project design and helped to identify appropriate forms of stakeholder participation.
Abstract # 49

UN REACH in Bangladesh: Facilitating multisectoral coordination for nutrition

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Introduction: UN REACH is a joint initiative of four United Nations (UN) agencies: Food and Agriculture Organisation (FAO), UN Children’s Fund (UNICEF), World Food Programme (WFP) and World Health Organisation (WHO). REACH aims to strengthen multisectoral efforts to scale up public health nutrition interventions targeted at the first 1,000 days of a child’s life.

Objectives: To describe the UN REACH project and how it facilitates multisectoral coordination for nutrition in Bangladesh.

Methods: Narrative review of the project.

Results: REACH uses innovative tools for in-depth scoping and analysis of the nutrition situation and for mapping activities and interventions across different sectors of government and partner organisations. Specific tools include “Stakeholder Mapping” and the “Dashboard” which can identify gaps in coverage and funding and contribute to better decision-making and coordination. These have been implemented at national level as well as in Satkhira District. They are proving useful for advocacy and for stimulating multi-stakeholder discussions on how best to scale up priority interventions in the areas of food, health and care. An innovative Multi-Sectoral Simulation Tool (MST) is also being piloted in Satkhira, in partnership with the World Bank. The MST is a causal model of the multisectoral “system” that links key nutrition intervention activities to nutritional outcomes. This could demonstrate proof of concept for the potential value of district-level multisectoral coordination, planning and monitoring of efforts to scale up nutrition. At central level, REACH is working to strengthen multisectoral platforms by establishing a network of Focal Points within different ministries. REACH will support these Focal Points to increase their understanding of the role of their sector in scaling up nutrition and how to influence increased attention to it.

Conclusion: REACH is not a project or a programme. It is a methodology to catalyze stronger multisectoral mechanisms for planning, coordinating and monitoring. Building on work already taking place, REACH facilitates linkages between the UN agencies, government and other stakeholders involved in nutrition-specific, as well as nutrition-sensitive, actions.
Abstract # 1

One Health, Shared Responsibility

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Introduction: It is a well-established truism that a successful effort to reduce disease and improve wellbeing requires preventive as well as curative interventions. Despite this underlying truth, the roles of ‘prevention’ and ‘cure’ are often split among different institutions and professional communities, causing a practice gap that results in poor progress on prevention. In no other area is this gap more evident, than the links between the health and the water, sanitation and hygiene (WaSH) sectors.

Objectives: The purpose of this research was to draw attention to simple, workable practices that can bring the varied sets of actors together, in a cost-effective and holistic approach that will deliver better health outcomes for Bangladesh’s population.

Methods: Available secondary literatures which are peer reviewed have been consulted along with relevant policy papers to establish the association between the claimed hypothesis of the need for joining health and engineering expertise for better public health outcomes which is self-evident, and has led to the introduction of public health acts and urban sewerage systems in rich countries.

Results: Yet this potential remains largely unrealized in many countries, including Bangladesh, and it continues to exact a toll on the country’s population. While WaSH are seen as an infrastructure issue that lies outside of the remit of the healthcare system, it is frontline health works who deal with the consequences of poor WaSH coverage on a daily basis.

Conclusion: While the WaSH sector has gained much expertise in producing and promoting appropriate and sustainable WaSH technologies, improving sanitation coverage and improved hygiene behavior in particular relies also on creating demand and changing behaviors – both areas where the health sector has a strong track record and recognized comparative advantage.
Serological evidence of Hepatitis E Virus in pigs and the history of jaundice among pig handlers in Bangladesh

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\textbf{Introduction:} Hepatitis E Virus (HEV) is the most common cause of viral hepatitis globally. Pigs may act as a reservoir of HEV and higher prevalence of antibodies to HEV in pig handlers has been found in neighboring countries including India and Nepal. Jaundice in pigs is considered to be a passive indicator of HEV infection in humans.

\textbf{Objectives:} We conducted a study to identify evidence of HEV infection in pigs and to understand pig’s role as a reservoir for HEV in Bangladesh by comparing pig exposure and history of jaundice between pig handlers and controls.

\textbf{Methods:} We collected blood samples from 100 pigs from three slaughterhouses in Gazipur district between January–June 2011. We interviewed 100 people who were occupationally exposed to pigs and 100 without any exposure and recorded their jaundice history for proceeding two years. We tested the swine sera for HEV specific antibodies (IgG, IgM or IgA) through competitive ELISA.

\textbf{Results:} Out of 100 swine sera, 82\% (n=82) had detectable antibody against HEV. Compared to the pigs that lacked HEV antibody, pigs with HEV antibody were older (21.5 vs. 9.6 months, p<0.001), were more likely to be raised in larger herds (mean herd size: 194, vs.125 pigs, p=0.008), and were more frequently indigenous breed (89\% vs. 39\%, p<0.001). Compared to controls, people who slaughtered pigs (39\% vs. 0\%, p<0.001), reared pigs (41\% vs. 0\%, p<0.001), butchered pigs (47\% vs. 1\%, p<0.001), and being a salesmen in pork shop (30\% vs. 0\%, p<0.001) were more likely to have a history of having jaundice in the preceding two years.

\textbf{Conclusion:} HEV was circulating in pigs in Bangladesh and history of jaundice was more frequent in pig handlers compared to their controls. Identifying and genotyping HEV in pigs and pig handlers may provide further evidence of pig’s role in zoonotic HEV transmission in Bangladesh.
Abstract # 57

**HPAI at the human-birds (wild and domestic) interface, as well as drug residues and resistances in organisms from animals are public health threats**

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**Introduction:** HPAI and drug residues and resistances are serious on-going animal and public health threats in Bangladesh.

**Objectives:** To describe the health threats by HPAI, drug residues and resistances among animals and humans.

**Methods:** We reviewed the findings from several collaborative studies conducted by CVASU in these fields and briefly presented the significant observations. The promising research areas that require a One-Health approach through cross-sectoral collaboration was also highlighted.

**Results:** The estimated AI sero-prevalence based on c-ELISA testing was 21% (N=437) in samples from resident wild birds, 11% (N=63) in migratory birds and 53% (N=92) in domestic ducks. Among the sampled resident wild birds the sero-prevalence was significantly \((p<0.001)\) higher in samples from crows (38%; N=163) than that of Asian pied starlings (16%; N=140), house sparrows (5%; N=83) and others. The sero-prevalence for the samples from crows varied significantly \((p<0.001)\) between hot (39%; 148) and cold seasons (26%; N=15). Similar seasonal trends were observed for Asian pied starlings and house sparrows. Among the samples from migratory birds northern pintail (19%; N=16) and tufted ducks (19%; N=16) were commonly affected. Among the samples from domestic ducks the sero-prevalence was significantly \((p<0.001)\) higher in the hot (67%; N=48) than cold (38%; N=44) seasons. The level of antibiotic residues in the milk, poultry and livestock meats crossed the threshold limits in Bangladesh. Amoxicillin, Tetracycline, Ciprofloxacin and Sulphadimidine resistance was observed against Salmonella, Escherichia and Pasteurella, infecting to layer poultry. A range of antimicrobial resistances was also identified against Salmonella, Escherichia and Staphylococcus isolated from effluent samples of veterinary as well as medical hospitals.

**Conclusion:** The preliminary results suggested H5 serotype in samples from crow and domestic ducks. Crow could be a potential silent reservoir of AI (HPAI H5N1?) which could pose animal and public health threats. Studies on drug residues and resistances in organism from livestock and poultry also indicated potential public health threats. Our HPAI wild bird project becomes the channel to develop the collaborations for multiple disciplines nationally and internationally.
Abstract # 58

**Spatial (broilers) infection in Danish meat producing chickens Campylobacter analysis and neighbourhood risk factors**

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Introduction: (EU)including the European Union ,In industrialized countries worldwide Different .campylobacteriasis is the most frequently reported bacterial zoonosis in humans studies have been conducted to identify the sources and how they relatively attribute to Handling and consumption of poultry meat has been .mylobacteriosis in humansca is also frequently isolated from .spp Campylobacter .identified as one of the major sources ,laid the bacteria can survive in water and so (sheep ,cattle)other production animals a nationwide surveillance ,In Denmark .which makes its transmission routes more complex to 1998and strategic control program in broiler population have been in action since A .broilers and to reduce transmission in humans from ,decrease the prevalence in broilers lack of understanding of the potential sources and transmission routes made it difficult to .in broilers .spp Campylobacter design and implement efficient control measures against

Objectives: s through gaining more To contribute to reducing human campylobacteriosi transmission routes and sources of ,temporal epidemiology-knowledge about spatio .infection in broilers in order to reduce the prevalence of infected flocks Campylobacter

Methods: spatial ,el density estimationkern)We employed several spatial analytical tools multivariable logistic and standard statistical procedures (semivariogram ,scan statistics temporal patterns and -to investigate spatio (regression with autocorrelation structure spatial )Range of influence .ed in Danish broilers identify risk factors for introduction and spr km in 13.5km and 9.6between farms were estimated at the distances (autocorrelation A longitudinal study was conducted to evaluate the neighbourhood risk .different years .factors

Results: temporal clusters in some areas of Denmark during -We observed persistent spatio We found a .the summer months indicating variable risk factors with space and time a within (broiler farms)significant protective effect with the absence of infected neighbours infection was accounted for Campylobacter Seasonal cyclic patterns of the .km 2distance of Predicted probability maps showed a heterogenous spatial .by using sine and cosine function .infection in Danish broilers Campylobacter and temporal risk of

Conclusion: temporal clusters will facilitate conducting targeted -Identification of spatio Information regarding risk factors for .surveillance and executing extra care in high risk areas ghly valuable to farms can be hi/spread and introduction of the infection in broilers the .design and conduct a more efficient control program
Abstract # 55

**One Health Approach to curb zoonoses: Bangladesh scenario**

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**Introduction:** The majority of human emerging pathogens are zoonotic and many have their origins in wildlife. The cost of new infections to societies in terms of human mortality and morbidity can be enormous.

**Objectives:** To explore the emerging zoonoses situation in Bangladesh, identify the country-specific responses in control and prevention, and determine the constraints and challenges to using the One Health approach to curb emerging zoonoses in Bangladesh.

**Methods:** We conducted a narrative review of published literature and reports archived in IEDCR and the DGHS of the Ministry of Health and Family Welfare.

**Results:** Major zoonoses outbreak occurring in Bangladesh during the last 5 years includes: HPAI A (H5N1), Anthrax, Nipah, Rabies, Japanese encephalitis. Progress has been made towards establishing inter-sectoral collaboration, validation and finalization of the Strategic framework for a One Health approach to infectious diseases in Bangladesh, establishment of collaborative IEDCR, DLS and icddr,b outbreak investigations in One Health approach for HPAI A (H5N1), and One Health research. Effective operation of collaborative outbreak investigations and surveillance of diseases at the human-zoonotic-environmental interface, establishment of inter-sectoral collaboration between MOFL and MOHFW on control of avian influenza, drafting of National Food Safety Emergency Response Plan focusing on One Health approach to engage the MOFL, MOA and MOHFW, elimination of Rabies from Bangladesh by 2020 - Vaccinate animals, bite management and vaccinate humans. Despite the progress, implementation of One Health approach faces several constraints and challenges. Identifying leadership for multisectoral response, lack of strong political commitment, lack of institutional arrangements for operationalizing One Health approach, lack of human resource at the DLS, lack of trained manpower, channeling of funds are some of the challenges. Possible solutions may include adopting health strategic framework, ensuring institutional arrangements and policy frameworks, building capacity in relevant sectors.

**Conclusion:** Establish institutional governance and policy frameworks for a One Health approach, advocating adoption of One Health approach to inform policy makers and relevant stakeholders, implementation of the One Health Strategic Framework for EIDs, enabling funds for One Health activities including research, surveillance, and capacity building.
Abstract # 41

**An entomological investigation of the first chikungunya outbreak in Bangladesh**

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**Introduction:** Chikungunya is an emerging vector-borne viral disease. In December 2008, an outbreak of chikungunya fever occurred in two rural areas of Rajshahi and Chapainawabganj districts of Bangladesh for the first time.

**Objectives:** We conducted an entomological investigation in the affected areas to identify the suspected vector mosquito species, vector density, type of mosquito breeding sites and entomological risk factors.

**Methods:** The entomological team visited the two case positive households and investigated 11 different houses within 500 diameters of each of the two chikungunya positive households. The distance of 500 diameters was selected based on flight ranges of the vectors of chikungunya. We also visited 5 houses in each of the three different villages in Poba and Baroghoria in search of vector mosquito. We searched for indoor and outdoor water containing receptacles for mosquito larvae to collect and transfer larvae in glass vials to IEDCR. Collected larvae were identified using the WHO Comprehensive Guidelines (1999). Number and type of positive containers for *Aedes* larvae were recorded. Breteau index was calculated to estimate the *Aedes* population density.

**Results:** *Aedes albopictus* was found in both the chikungunya affected areas of two districts. We did not find *Aedes aegypti*. We found a high level of breteau index (BI 75) in Rajshahi. The breteau index of Chapainawabganj was 8.3. No vectors were found in areas without reported patient. We observed that the positive container (earthen pots) always remained filled with water and the potters regularly used them to make earthen pot.

**Conclusion:** *Aedes albopictus* is the suspected vector for the chikungunya outbreak in Poba and Baroghoria. Abundance of suspected vector in dry season was directly related to the professional habit of potter. As containers remained filled with water, these serve as good breeding sites of *Ae. albopictus* during the dry season. Earthen pots served as the main breeding sites of the vector. Dry breeding sites might serve good breeding sites during the upcoming rainy season.
Etiologic studies of patients visiting different diarrheal disease facilities in Bangladesh

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Introduction: Diarrhoea still remains one of the commonest causes of childhood morbidity and mortality in Bangladesh.

Objective: The objective of the study was to compare the distribution of common enteric diarrhea-causing organisms and their relative antimicrobial susceptibility in 4 hospital-based diarrheal disease surveillance systems.

Methodology: Total 13,959 patients irrespective of age and sex, comprising of 2,820 from rural Mirzapur, 2,865 from rural Matlab, 5,287 from other parts and 2,987 from Mirpur of urban Dhaka were included into the study from January 2010-December 2011.

Results: Rotavirus was the commonest isolated organism across all sites. In Mirzapur, it accounted for 28% of cases, 24% in Dhaka, 19% in Matlab and 18% in Mirpur. Shigella was the second most prevalent organism in Mirzapur (13%) but least commonly isolated in Dhaka (3%), Matlab (7%) and Mirpur (3%). In these 3 sites, V. cholerae was the second most prevalent organism (14%, 9%, and 12% respectively). In Dhaka, Entero Toxigenic Escherecia Coli (ETEC) was the next common organism (8%) after rotavirus and V. cholerae. S. flexneri was the most prevalent Shigella serotype in all facilities accounting for 40-54% of Shigella infections, or 1-7% of total diarrhoea cases. S. dysenteriae was least common. S. sonnei was the second most commonly identified serotype in Mirzapur (28% of Shigella infections, or 4% of total cases) and Dhaka (24%, 1%), whilst S. boydii was second in Matlab (8%, 1%) and Mirpur (25%, 1%). In Mirzapur 60% of Shigella isolates were susceptible to ciprofloxacin while 72% were susceptible to mecillinam. The 10%-50% isolates were susceptible to other antibiotics including ampicillin, Trimethoprim-Sulfathmethoxazole (TMP-SMX), and nalidixic acid. Shigella susceptibility to ampicillin ranged from 47-68%: TMP-SMX, 23-38%, and nalidixic acid, 10-36% between sites.

Conclusion: V. Cholerae exhibited greatest geographic heterogeneity than Shigella serotypes for resistance to antimicrobials. Ciprofloxacin was the drug with the least detected resistance. TMP-SXT showed the greatest variation in resistance, with 2% of strains susceptible in Dhaka and 19% in Matlab. For all organisms tested for susceptibility, Dhaka had the highest average rate of antimicrobial resistance. Isolation rates of common enteric pathogens varied between sites. Larger variations were however detected in antimicrobial susceptibility patterns.
Abstract # 14

**Role of support person presence during delivery to increase exclusive breastfeeding prevalence in rural, Bangladesh**

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**Introduction:** Link between exclusive breastfeeding (EBF) and neonatal mortality reduction is established. Family members or support person throughout the pregnancy plays an important role to ensure EBF. They are mostly responsible for decision making process and avoiding harmful practices both for mother and her child.

**Objective:** To determine the association between presence of support person during delivery care and EBF practices in a continuum of maternal and child health care programme at Matlab, Bangladesh.

**Methods:** The study area was located in Matlab, Bangladesh where icddr,b has been maintaining a health and demographic surveillance (HDSS) system since 1966. icddr,b has been providing basic maternal, child health and family planning services (MCH-FP) since 1977. The MCH-FP services were redesigned to improve high maternal and neonatal mortality prevailing in the area. Under this programme each mother was asked to choose a support person (SP) with selected criteria who will help her during pregnancy, delivery and afterwards. The SP needed to be present during health worker household visit and needed to attend four training sessions on birth preparedness and complication readiness along with pregnant women at field workers houses. EBF was calculated who didn't take anything other than breast milk except medicine or oral saline up to 6 month of age. In this study, data were analyzed from 4081 women who delivered either at home or icddr,b facility during the period 2008 and 2009.

**Results:** About 50% (2040) SP were present during delivery. The proportion of EBF has increased from 50% to 63% over the year (p=.0005). Those women who had SP present during delivery were 1.2 times more likely to have EBF infant (OR = 1.2; 95% CI: 1.01-1.32) than who didn’t have (after adjustment).

**Conclusion:** Presence of SP during delivery either at home or facility has a positive effect on EBF status at the population level.
Improving Public Health Education: Lessons Learned and Moving Forward

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Introduction: Many low income countries like Bangladesh suffers from mal-distribution of health resources, with most of its healthcare training institutions concentrated in urban areas, particularly Dhaka.

Objectives: To find the challenges and recommendations having implications for Bangladesh.

Methods: This presentation reviews global and local literature on public health education.

Results: A review of the literature and a recent assessment by the School of Public Health on the state of MPH education (in 2012) points to concerns with poor quality of education and curriculum and the lack of diversity of candidates trained in MPH programs in many countries, including Bangladesh. The literature finds that in many developing countries, public health workers tend to be elites and medical doctors. In South Asia, gender biases, restricted mobility, and social norms result in the under-education of females, which has a medical profession primarily male dominated. Studies on public health education find there is neglect of other public health sciences and emerging health problems and a continued emphasis on with the emphasis on certain topics, teaching styles, evaluations and classroom based learning, rather than practice based learning from communities on the ground. Studies highlight the critical importance of developing faculty competencies in teaching and learning. Schools of public health need to develop and review basic competencies of faculties teaching in public health institutions regularly, ensure pedagogical methods are update to date, and encourage critical thinking and problem solving among the students, the teaching and learning is practical and field based. The global context of health and disease is such that faculty and teachers need to be familiar and aware of the dynamics and nature of public health. Opportunities like strategic use of research fellowships, pedagogical training, mentoring, and co-teaching with more experienced faculty, faculty and student-led research, institutional partnerships, guest lectures, conferences and other methods are all means of improving and expanding classroom-based didactic instruction of faculties and will produce competent, creative and diligent graduates who can capable workers.

Conclusion: Paying attention to these recommendations and with more emphasis on a clear set of competencies for graduates globally and locally, would contribute to overall improvement of the quality of public health programs. A standardized curriculum which is recognized in developing countries, such as Bangladesh, will result in the development of effective public health leaders who will be more engaged and competent to effectively tackle diverse health problems with a more holistic approach.
Abstract # 31

Experience from community based childhood burn prevention programme in Bangladesh: Implication for low resource setting

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Introduction: A comprehensive community-based burn prevention framework was developed for rural Bangladesh taking into consideration the magnitude, consequences of burns, risk factors of childhood burn, health seeking behaviour of parents after a burn injury of a child and the perception of community people.

Objective: This paper explains the comprehensive framework of the childhood burn prevention programme and describes its acceptability, feasibility and sustainability.

Methodology: A number of methodologies were adopted in developing the framework, including: (i) building up relevant information on childhood burn and prevention methods, (ii) arranging workshops and consultation meetings with experts and related stakeholders and (iii) piloting components of the framework on a small scale. The framework was piloted in a small scale to explore its feasibility acceptability and sustainability.

Results: Lack of supervision of the children, hazardous environment at home and the low level of awareness about childhood burn and other injuries were identified as the major attributes of childhood burn in Bangladesh. To address these factors “Triple S” strategies were identified for the prevention framework. These strategies are: (1) Safe environment, (2) supervision, and (3) skill development. According to these strategies, home safety, community crèche, school safety, formation of community groups and general awareness activities were identified as the different components of the childhood burn prevention framework in rural Bangladesh.

Conclusion: The framework was found to be acceptable by the community. It is also expected to be feasible and sustainable as very low cost and locally available technology and resources were utilized in the framework. Large scale piloting is necessary to explore its effectiveness and ability to scale up all over the whole country.
Abstract # 52

**Relative efficacy of two regimens to control soil transmitted infections among poor pre-school children in Bangladesh**

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**Introduction:** Soil transmitted helminthic (STH) infections are endemic in countries where the highest rates of poverty exist. The most common STH infections are *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworm. Control strategies for STH infections include health education, improved sanitation and drug treatment.

**Objectives:** To compare the relative effectiveness of two regimens of albendazole treatment for STH infections - 400mg at every 3 months versus conventional treatment of albendazole 400mg at every 6 months to reduce the prevalence, and intensity of STH infections.

**Methodology:** 200 children aged 2 to 5 years were recruited from Mirpur, Dhaka, Bangladesh and randomly assigned to two groups. The Interventional Group (IG) received 400 mg Albendazole at enrollment and at 3-months interval and the Conventional Group (CG) received 400 mg Albendazole at enrollment and at 6-months interval for 1 year.

**Results:** One hundred ninety four children (IG: 96 and CG: 98) completed 12 months follow-up. The prevalence of *A. lumbricoides* infection reduced from 56% to 24% at one year (p <0.001) in the IG. Mean egg burden of *A. lumbricoides* also decreased from of 8344 eggs per gram of stool (epg) (95%CI: 4875, 11813) to 915 (95%CI: -128, 1957) epg at one year (P<0.0001). But no significant changes occurred in prevalence and epg of *A. lumbricoides* in 6 month CG. The prevalence of *T trichiura* infection reduced from 81% to 38.5% at one year (p<0.0001) in the IG and egg burden significantly decreased from 283 epg (95%CI: 191,375) at baseline to 67 epg (95%CI: 44, 90) at one year in the IG (p<0.0001).

**Discussion:** Administration of albendazole at 3-months interval was more effective than the standard 6-months interval treatment to reduce the burden of *A. lumbricoides*.

**Conclusions:** The treatment with albendazole at every three-months interval is effective to reduce prevalence and intensity of *A. lumbricoides* infection.
Abstract # 51

**Social autopsy: A social intervention to aware community on maternal and neonatal deaths in Bangladesh**

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**Introduction:** Social autopsy (SA) is an innovative strategy whereby a trained member leads a group within a community through a structured, standardized analysis of the root causes of a death or serious, non-fatal health event. The root causes considered encompass physical, environmental, cultural, and social factors. The dialogue engaged in through the formal process elicits the causes, as well as suggests preventive measures that are appropriate and achievable in the community.

**Objectives:** To scrutinize social errors responsible for a maternal or neonatal death and to facilitate and utilize community strength in determining how it could be prevented in a community in future.

**Methods:** Four districts of Bangladesh namely Thakurgaon, Narail, Moulvibazar and Jamalpur with 6.1 million populations have been taken for the study. Government health and family planning field level staff were trained to perform a social autopsy for maternal, still birth and neonatal death to provide some social intervention in the community.

**Results:** Every death in the community is unique and a sad story. Rural community in Bangladesh is capable to explore the social reasons behind the medical cause of the death without blaming individual or group held responsible for the death. Social autopsy is a useful instrument to aware and set off community to act on maternal and neonatal deaths.

**Conclusion:** Social autopsy started to deliver some important massages to the community after a death occur which could play a significant role in reduction of maternal and perinatal death in Bangladesh.
Abstract # 32

Mass sociogenic illness in a school feeding program in northwest Bangladesh

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Introduction: During October 2010, an acute gastrointestinal illness outbreak following consumption of high energy biscuits distributed to students in a school feeding programme was reported from five primary schools in two sub-districts of Gaibandha.

Objectives: To describe the illness in terms of person, place and time, and determine the cause and community perceptions.

Methods: We defined suspected cases as students from affected schools reporting any two symptoms (nausea, vomiting, abdominal pain, heartburn, bitter taste, headache, chest tightness, diarrhoea) after eating biscuits on the day of illness. We conducted in-depth interviews and group discussions with students, teachers, parents and community members to explore symptoms, exposures, community perceptions, and construct a timeline of events. We conducted questionnaire survey among cases, and microbiological and environmental investigations.

Results: Among 142 students seeking hospital care, 44 from four schools qualified as suspected cases. Of these, we surveyed 30 who had a mean age of 9 years, 70% (21/30) were females. Symptoms included abdominal pain (93%), heartburn (90%), bitter taste (57%), headache (43%) and nausea (40%). All students recovered within a few hours. No pathogenic Vibrio, Shigella or Salmonella were isolated from collected stool samples. We found no rancid biscuits in schools and storage sites. The female index case perceived the unusual darker packet label as a devil’s deed that made the biscuits poisonous. Some students, parents and community members reported concerns about rumors of students of the index school dying after eating the biscuits.

Conclusion: Rapid onset, followed by rapid recovery of symptoms, female preponderance, and inconsistent physical, microbiological and environmental findings suggested mass psychogenic illness rather than a foodborne or toxic cause. The rapid spread of rumours of student deaths heightened community anxiety that propagated this outbreak. Sharing outbreak investigation results and reassuring students and parents through regular health communication campaigns could limit future outbreaks.
Seasonal variations in the etiology of major diarrheal pathogens in different geographical areas in Bangladesh

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Introduction: Bangladesh is still a high burden country for diarrhea. To further control the burden of diarrhea, we need to find out the seasonal variation in etiology of major pathogens of diarrhea.

Objectives: To shed light onto the recent seasonal variation of diarrhea and to determine the seasonality, clinical profile of hospitalized diarrhea patients and urban-rural differences of common enteric pathogens.

Methods: Seasons were categorized as hot summer (March-May); monsoon (June-September), and winter (October-February). A total of 14,257 diarrhoea patients from 4 diarrhoea treatment facilities in Bangladesh [Kumudini Hospital (KH) (n=3,089), Dhaka Hospital (DH) (n=5,311), Mirpur Treatment Centre (MTC) (n=2,990), and Matlab Hospital (MH) (n=2,867)] irrespective of age, were enrolled from the diarrhoeal disease surveillance system during the study period (2010-2011).

Results: 42% patients were female. Rotavirus (22%) was the most common pathogen followed by Vibrio cholerae O1 (10%), Shigella (6%) and ETEC (6%). 41% patients presented during the hot summer months, followed by winter (37%). Rainy season had the lowest recorded rates of diarrhoea hospitalizations, [KH, n=600 (19%); DH, n=1168 (22%); MTC, n=727 (24%) and MH, n=620 (22%)]. The proportion of children among total patients peaked during winter season [KH (74%), DH (53%), MTC (41%) and MH (50%)]. In all study sites, the majority of the patients were children <2 years. Dehydrating diarrhoea was most commonly identified in ≥15 years old in summer months (59%, 70%, 70%, 81% respectively), followed by children <2 years. Use of intravenous saline was greater in ≥15 years and highest in Mirzapur amongst children (<2 years) (33%). Rotavirus cases peaked during the winter months. Shigella was most prevalent in summer months across the facilities [KH (55%), DH (43%), and MTC (40%)] except Matlab, where it was predominant during winter months (45%). Vibrio cholerae cases were more commonly identified in the hot summer season (ranged DH:16-52%; MTC:25-42%; MH:13-68%) for all sites except Mirzapur (ranged 33-34%), where prevalence did not show any distinct seasonality. ETEC [MH:55%, DH:49%] was frequently isolated during summer months.

Conclusion: Understanding of the seasonal variation of enteric pathogens could help enable clinicians to select appropriate antimicrobial therapy. The data provided by this study is paramount in facilitating an understanding of environmentally-driven diarrhoea in Bangladesh.
Abstract # 13

**Risk factors of non-fatal drowning among under 5 years old rural children**

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**Introduction:** Drowning is a common cause of accidental childhood mortality and morbidity in rural Bangladesh.

**Objectives:** To find out the association of socio-economic status and child care practice with non-fatal drowning in rural Bangladeshi children

**Methods:** This community based case-control study was conducted in 1-5 years old rural children in Raigonj sub-district of Bangladesh. Age-matched 122 cases and 134 controls were recruited and their mothers were interviewed using a structured questionnaire. Univariate analyses and logistic regression were performed to analyse the data.

**Results:** Significant association of non-fatal drowning was noticed with mothers’ poor education (P<0.001), young age (P<0.005), single status (P<0.001) and having more than three children (P<0.001). Non-fatal drowning was twelve and five times more likely to be experienced by children of illiterate mothers than the children of mothers’ having academic knowledge of 6th to 10th grade (OR with 95% CI 0.08 [0.02-0.26]) and above 10th grade (OR with 95% CI 0.21 [0.04-0.95]) (P<0.001), respectively. Poor socio-economic status indicated by low family expenditure (P<0.001) and no house (P<0.05 OR with 95% CI 0.58 [0.17-0.99]) were factors of childhood drowning. Study showed that with the better child care as measured by child care index the occurrence of non-fatal drowning significantly decreased (P<0.001). Main caregiver other than mother also showed significant association with non-fatal drowning (P<0.001). The forward LR logistic regression model identified mothers’ education as the best predictor of non-fatal drowning.

**Conclusion:** Proper care of children might be ensured through mothers’ empowerment and improving socio-economic status and thus drowning in children can be prevented.
Abstract # 19

Types and determinants of anemia in Bangladeshi type 2 diabetics

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Introduction: Anemia is a common finding in patients with diabetes due to the presence of multiple factors like nutritional deficiencies, inflammation, comorbid autoimmune diseases, drugs and kidney diseases.

Objectives: To investigate the prevalence, types and determinants of anemia in a group of Bangladeshi type 2 diabetic patients (T2DM) attending a tertiary hospital.

Methods: Under a cross-sectional survey design a total number of 217 type 2 diabetic patients were purposively selected from the outpatient department of Bangladesh Institute of Research and Rehabilitation for Diabetes, Endocrine, and Metabolic Disorders. Socio-demographic and clinical data were obtained by interview and reviewing the guidebooks. Daily dietary intake of the participants was calculated by 24 hour recall method. All participants were screened for anemia with a full blood count using an auto-analyzer (Abbott, USA). Hemoglobin was determined by spectrophotometric method, creatinine by alkaline picrate method using a chemistry auto-analyzer and serum ferritin by ELISA method. Anemia was defined by World Health Organization criteria (<13 g/dl for men, and <12g/dl for women).

Results: The mean (SD) age of the participants was 53.04 (8.3) years. Anemia was detected in 128 (59%) participants but the proportion varied significantly between males (53.1%) and females (67.8%, p=0.03). Among the anemic diabetics 24.2% had microcytic hypochromic, 72.7% had normocytic normochromic and only 3.1% had macrocytic anemia. Serum creatinine level, on average was significantly higher in anemic participants (1.2±0.4mg/dl) than in those without anemia (1.0±0.1 mg/dl, p=0.007). Significant negative correlation of haemoglobin with serum creatinine (p>0.04) and age (p>0.01) was found. The daily dietary intake of protein and iron of anemic group was significantly lower than the non-anemic group (p<0.05). There was a significant negative correlation of Hb with serum creatinine (p=0.05) and age (p=0.01) and significant positive correlation between Hb and daily dietary intake of iron and folic acid (p<0.05). On logistic regression analysis, serum creatinine level (p=0.02) and dietary intake of iron was positively (p=0.05) associated with anemia after adjusting the effects of age, sex, occupation, BMI, duration of diabetes, fasting blood glucose, serum creatinine, serum ferritin, history of nephropathy and daily dietary intake of protein, iron, folic acid and vitamin B12. No association was found between types of anemia and other independent variables on logistic regression analysis.

Conclusion: A high proportion of Bangladeshi T2DM patients also suffer from anemia. Renal involvement seems to be an important determinant for anemia in T2DM.
Alcohol consumption in adult Saontal women

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Introduction: Alcohol is used in Saontal communities both by men and women as part of their culture. In women alcohol offers extra harmful effects such as it is a risk factor for breast cancer and alcohol has bad effects in pregnancy too. It is imperative to know the extent of alcohol consumption in Saontal women and its risk factors to prevent and control this devastating habit.

Objectives: To determine the extent and risk factors of alcohol consumption in Saontal women.

Methods: This community-based cross sectional study was undertaken from January to June 2012 on purposively selected 152 adult Saontal women of Thakurgaon district. A pretested semi-structured questionnaire was used for interviewing the participants.

Results: The average age of study women was 37.19 years. Majority were married (96.1%), illiterates (81%), and below poverty line (96.7%) and one-third were farmers. The lifetime drinking and past-year drinking prevalence were 71.1% (95% CI, 63.9 to 78.3) and 61.8% (95% CI, 54.0 to 69.5), respectively. Farmers were about four times more likely to be lifetime (OR3.87; 95% CI, 1.44 to 10.36) and past-year drinkers (OR3.78; 95% CI, 1.59 to 8.96) than housewives and day-laborers and used to drink more frequently (48.1%). None of them were dependent on alcohol. The amount (p<0.001) and frequency (p=0.01) of alcohol consumption were significantly higher in women of ≥ 50 years of age and in those who started drinking at an earlier age. Most of the respondents (71%) used to drink as part of their culture although majority (88.8%) claimed that it was their own decision to drink. Those who were least culturally adherent started alcohol drinking at a significantly older age (p<0.001).

Conclusion: Alcohol prevalence is high among Saontal women but they are not alcohol dependent and their drinking habit is influenced by their culture. An awareness program needs to be undertaken about harmful consequences of alcohol consumption with due respect to their culture.
Sero-conversion in chronic hepatitis B infection after treatment

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Introduction: Hepatitis B chronically infects nearly 350 million people worldwide and 5.5 to 10% people in Bangladesh. Bangladesh ranks in high endemicity category, in terms of its 10-15% hepatitis B surface antigen carrier state. About 40% of hepatitis B infected persons may develop cirrhosis or hepatocellular carcinoma. Anti-viral drugs can prevent these consequences through seroconversion. Seroconversion may be defined as loss of serum HBeAg and the development of anti-HBe antibodies.

Objectives: To determine the proportion of hepatitis B sero-conversion after anti-viral therapy and its associated socio-demographic and treatment related factors.

Methods: Cross-sectional study was conducted from January-June’12 on 74 chronic hepatitis B infected persons having anti-viral treatment for at least six-months. Data were collected by interview and document review.

Results: Proportion of HBeAg sero-conversion was 33.8 % (95% CI, 23.1 to 44.6) and anti-HBe was 24.3%. Sero-conversion was four and half times more likely to be occurred in >30 years old infected persons than the younger ones (OR 4.65; 95% CI, 1.505 to 14.377). Significantly higher rate of sero-conversion was noticed in service holders (44.7%) than participants with other occupations (p=0.02). Higher sero-conversion was noted in females (40%), married (39.6%), better educated (36.0%) and persons with better economic status (40%) but was not significant. Sero-conversion was more common in participants who acquired infection at >30 years of age (46.2%) and who started treatment 20 days earlier. Sero-conversion was less common in those who had jaundice (27.8%) before HBV infection. High base-line ALT level and low base line HBV-DNA showed better conversion. Both ALT and HBV-DNA level decreased after treatment. Combination regimen with two drugs showed better result than single or >2 drugs regimens. Adefovir showed higher sero-conversion (53.0%).

Conclusions: Anti-viral drugs were found to be effective in one-third of the chronic hepatitis B infected persons. Initiatives may be taken to create awareness in chronic hepatitis B infected persons about availability of such drugs. Policy makers may be advocated to develop strategy for making those drugs available and affordable.
Abstract # 24

**Zoonotic Parasites of the Pigs of Bangladesh**

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**Introduction:** Pigs in Bangladesh are mainly reared by non-Muslim minorities including tribal communities, Christians and lower caste Hindus. Pigs can harbor and spread zoonotic parasites more efficiently compared to other domestic species.

**Objectives:** We conducted this cross-sectional study to know the prevalence of zoonotic parasites among the domestic pigs of Bangladesh.

**Methodology:** We sampled pigs from the tribal communities of Tangail and Rangamati districts. We collected faecal samples in 10% formalin. Faecal sample examination was conducted following Stoll’s ova counting method in the Laboratory of Department of Parasitology, Veterinary Science Department of Bangladesh Agricultural University.

**Results:** We sampled 259 pigs of which 124 (47.90%) were from Tangail and 135 (52.10%) from Rangamati. 62 (23.90%) were from scavenging system, 147 (56.80%) from semi-intensive system and 50 (19.30%) from intensive system. Most pigs were local breeds (182/259; 70.30%), 17 (6.60%) were exotic breed and 60 (23.20%) were cross between local and exotic breed. We identified six species of helminths with zoonotic importance including *Ascaris* sp. (42.10%), *Gnathostoma* sp. (8.90%), *Trichuris* sp. (11.60%), *Fasciolopsis* sp. (32%), *Diphyllobothrium* sp. (1.50%) and *Taenia* sp. (3.90%). The prevalence of *Ascaris* sp., *Gnathostoma* sp., *Trichuris* sp. and *Fasciolopsis* sp. was significantly higher (p<0.05) in pigs from Tangail as compared to Rangamati. The prevalence of *Ascaris* sp., *Gnathostoma* sp., *Trichuris* sp. and *Fasciolopsis* sp. was significantly (p<0.05) higher among the scavenging rearing compared to intensive and semi-intensive system. The ova of *Taenia* sp. were present only among semi-intensive system pigs.

**Conclusion:** Previous studies have confirmed *Ascaris lumbricoides*, *Trichuris trichiura* and *Fasciolopsis buski* among Bangladeshi children. Domestic pigs can carry and shed zoonotic parasites. Further investigation could determine the prevalence of these parasites among the pig-raising communities which will be helpful for understanding the disease epidemiology and developing strategic control measures.
Abstract # 25

**Bangladeshi agricultural workers’ pesticide use practices and awareness and experience with toxicity symptoms**

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**Introduction:** Bangladesh has promoted pesticide use to expand agricultural growth. Pesticide use is increasing rapidly from 13,000 metric tons in 1999 to 45,000 metric tons in 2009.

**Objective:** To assess knowledge and practices regarding pesticide use and to identify toxicity symptoms experienced by agricultural farmers.

**Methods:** A survey was conducted among 204 agricultural farmers in Comilla District during May-June 2009 with a standardized questionnaire.

**Results:** Out of 204 pesticide users, 26% did not know the name of the pesticides they used while 27% had no awareness of pesticide related side effects. A total of 17% users had received local training on proper use of pesticides but 34% did not follow the instructed dosage and precautions. A total of 87% farmers used a cloth mask while spraying but 34% used their bare hands to mix the pesticide solution with water. Among the surveyed farmers, 17% collected pesticides in recycled bottles. A total of 59% farmers have experienced toxicity symptoms at least once while applying pesticides with several common symptoms, including headache (60/121), burning eyes (59/121), itching (54/121), watering of eyes (44/121), weakness (41/121), and nausea/vomiting (40/121).

**Conclusion:** The study showed that toxicity experience have been lower among farmers who got training and followed instructions of pesticide application and have shower/bathing immediately after spraying. The study reveals that farmers have high exposures to pesticides in surveyed area and are at risk for pesticide poisoning due to lack of training and infrequent use of personal protection during pesticide application. The findings of the current study suggest that community level training on safe use of pesticides could reduce exposure among agricultural workers.
Abstract # 2

Low prevalence of Leishmania donovani infection among the blood donors in kala-azar endemic areas of Bangladesh

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Introduction: Visceral leishmaniasis (VL) is a public health problem in Bangladesh with highest burden in the Mymensingh District. The disease is transmitted by the bite of sand fly, but it could also be transmitted through blood transfusion. No information is available about the prevalence of leishmania infection among blood donors in Bangladesh.

Objectives: To determine the prevalence of Leishmania donovani (LD) among the blood donors in a kala-azar endemic district of Bangladesh.

Methods: A total of 1195 voluntary blood donors in the Blood Transfusion Department, Mymensingh Medical College Hospital, Mymensingh from August, 2010 to April, 2011 were enrolled into the cross-sectional study. After obtaining written consent, the socio-demographic data and past history of illness was collected. The laboratory technician performed the rK39 strip test using two drops of finger pricked blood and if the test was positive, then 3.0 ml of venous blood was drawn for polymerase chain reaction (PCR) analysis.

Results: The mean age of blood donors was 27 (SD, 7.95) years and 82.4% of them were males. The majority of the donors were literate and had a better socio-economic condition reflected by better household condition. Only 2.6 % had a family member with VL in the past. Three blood donors were positive for leishmania infection by rK39 strip test (0.3 %, 95%CI: 0.05-0.73). None of these 3 had active leishmania infection as demonstrated by PCR. During six months follow up, neither rK39 positive (N=3) or rK39 negative (N=1192) donors developed VL.

Conclusion: The risk of LD transmission by blood transfusion is very low. Therefore the chance for transmission of VL through blood transfusion is negligible. We believe that the National VL Elimination Program does not need to set up a routine screening for LD infection in the blood transfusion centres located in the VL endemic areas of Bangladesh.
Abstract # 4

**Emergence of Shigella sonnei sero-groups in Bangladesh: observations from four different diarrhoeal disease health facilities**

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**Introduction:** Shigellosis, the leading infectious cause of childhood morbidity and mortality, still continues as a public health challenge for developing countries including Bangladesh.

**Objectives:** This study aimed to demonstrate the recent emergence of *S. sonnei* and *S. boydii* and the geographical diversity in Bangladesh.

**Methods:** All patients coming from the Health and Demographic Surveillance System area in Matlab and Mirzapur, and 2% sub-sample from Dhaka Hospital and 10% from Mirpur treatment centre were enrolled systematically. We extracted data from archives of four different diarrhoeal disease surveillance systems including: Dhaka Hospital (2008-11), Matlab (2008-11), Mirpur (2009-11), and Mirzapur (2010-11).

**Results:** In Dhaka hospital, *Shigella flexneri* in 2008 accounted for 58% of all *Shigella* isolates, which decreased to 48% in 2011. Similar decreasing trends were seen in Mirpur, which decreased from 55% to 29% between 2009 and 2011, and in Mirzapur from 59% to 47% during 2010-11. However, Matlab data showed similar distribution rates (73%, 82%, 77%, and 81% respectively) over the period. Among under-5 children, similar decreasing isolation rates were found in Dhaka (54-40%), Mirpur (42-18%) and Mirzapur (61-46%). *Shigella sonnei* showed increasing trends in overall distribution in Dhaka (9-25%), and Mirpur (10-33%); a declining rate in Mirzapur (32-23%) and a static rate in Matlab (5-8%). Isolation rate was higher among children under 5 years old in Dhaka. Increased proportion of overall and under-5 distribution rates of *Shigella boydii* were found in Mirpur (14-31%; 17-29%) and Mirzapur (3-28%; 3-27%) over the period. In Dhaka, the rate decreased (25-16%; 16-9%) and remained static in Matlab (13-8%; 9-7%). For *Shigella dysenteriae*, the distribution decreased in Matlab (9-3%), Mirpur (10-7%) and Mirzapur (6-3%); whereas the rate was similar in Dhaka (9-10%).

**Conclusion:** Emergence of *S. sonnei* and *S. boydii* as infectious diarrhoea causing agents and understanding their geographical distribution require routine monitoring through long-term clinical, epidemiological and laboratory studies.
Abstract # 5

**Comparison of clinical and laboratory characteristics of intestinal amoebiasis with shigellosis among patients visiting a large urban diarrhoeal disease hospital in Bangladesh**

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**Introduction:** Shigellosis, the leading infectious cause of childhood morbidity and mortality, still continues as a public health challenge for developing countries including Bangladesh.

**Objective:** To compare clinical and socio-demographic characteristics of intestinal amoebiasis (IA) and shigellosis.

**Methods:** A case-control study was conducted among patients enrolled in diarrhoeal disease surveillance between 1993 and 2011. One hundred and ten cases with intestinal amoebiasis and 330 controls with shigellosis were recruited in the age group 0-14 years from the. We had cases and controls and 261 cases and 783 controls in the age group 15 years and above.

**Results:** Among the patient 0-14 years the likelihood of IA was greater than shigellosis among slum dwellers [2.25 (1.30, 3.88)] with poorer socio-economic conditions [unadjusted OR (95 % CI); 1.78 (1.12, 2.82)]. Patients with IA more often presented with watery stool [2.37 (1.49, 3.77)] and dehydrating diarrhoea [1.71 (0.96, 3.03)] and less often had fever [0.33 (0.13, 0.79)], but more frequently presented with abdominal pain [1.67 (1.05, 2.68)] than those with shigellosis. On the other hand, patients aged 15 years and older, higher proportion of patients in this age group with IA were living in the slum [unadjusted OR (95 % CI); 1.37 (1.13, 2.48)] and presented with watery stool [5.88 (4.05, 8.56)] with dehydrating diarrhoea [2.48 (1.77, 3.49)]. Lesser proportion of patients with IA had presence of red blood cell (RBC) [0.30 (0.18, 0.48); 0.25 (0.18, 0.34)], pus cell (11 to > 50/HPF) [0.16 (0.09, 0.27); 0.19 (0.13, 0.26)] and macrophage (1 to10/HPF) [0.23 (0.14, 0.37); 0.16 (0.12, 0.22)] in their stool as evident by microscopy as the patients with shigellosis. Greater proportion of patients with IA had an alkaline stool pH than patients with shigellosis among the paediatric age group [3.95 (1.95, 8.16)]; however, it was identical in 15 years and above age group. In multivariate analysis, individuals aged 0-14 years, abdominal pain [adjusted OR (95 % CI); 2.69 (1.34, 5.39)], fever [0.32 (0.11, 0.91)], and RBC [4.31 (1.63, 11.40)], pus cell [0.06 (0.02, 0.15)] in alkaline stool [0.16 (0.07, 0.35)] were independently associated with IA; and among individuals aged 15 years or older, watery stool [0.45 (0.28, 0.73)], living in the slum area [1.88 (1.12, 3.14)], and RBC [0.45 (0.22, 0.94)], pus cell [0.21 (0.12, 0.35)] in stool were independently associated with IA.

**Conclusion:** Results of our analyses suggest possibility of differentiating the clinical and the laboratory features of IA from shigellosis to initiate appropriate treatment.
Abstract # 8

**Disease severity and common aetiology of diarrhoea among under-five children in Mirzapur of rural Bangladesh**

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**Introduction:** There is a lack of comparative information on the severity of diarrhoeal diseases with aetiologic agent.

**Objectives:** The study aimed to compare the aetiology of under-five children with moderate-to-severe diarrhoea (MSD) and mild diarrhoea (MD).

**Methods:** MSD was defined if any of the following was present - sunken eyes and/or wrinkled skin and/or visible or reported blood in stool; or a child is hospitalized with diarrhoea or dysentery; or a child needs/received intravenous rehydration. Children below 5 years without any signs of MSD constituted mild diarrhoea (MD). Overall, 2,324 under 5 children were enrolled from January 2010 – December 2011 from the demographic surveillance system (DSS) catchment area of rural Mirzapur, Tangail, Bangladesh.

**Results:** Rotavirus (33%) was the leading cause of diarrhoea for children >5 years; 90% belonged to >2 years. *Shigella* represented 14% of total isolates and 45% children aged 24-59 months (45%) suffered from shigellosis. In Mirzapur, *Shigella* was the commonest isolated pathogen (27%) followed by rotavirus (16%) among >5 years children who presented with MSD. Rotavirus was the commonest cause (43%) among those who had reported with MD. Under-5 children infected with *Shigella flexneri* (17% vs. 2%; p<0.01) and *Shigella sonnei* (8% vs. 1%; p<0.01) were more common in those who presented with MSD compared to their counterparts with MD. Isolation rates of ETEC (3% vs. 3%) and *V. cholerae* (3% vs. 2%) were found to be similar in both the cases. MD cases often presented with watery stool. Conversely, straining and sunken eye were frequently manifested by individuals with MSD infected with ETEC, rotavirus, *Shigella* and *Vibrio cholerae*. Fever was a common presenting feature of MSD compared to cases with MD in >5 years children except children infected with *Vibrio cholerae*.

**Conclusion:** *Shigella* was the leading pathogen that caused MSD; whereas, rotavirus often caused MD among children less than 5 years old in rural Bangladesh.
Abstract # 11

**Severity of diarrhoea and its association with malnutrition among under-five children in rural Bangladesh**

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**Introduction:** Diarrhoea still continues as a public health challenge for developing countries including Bangladesh.

**Objectives:** To determine the predictors of severity of diarrhoea irrespective of nutritional status in malnourished and well-nourished >5 children in rural Mirzapur, Tangail, Bangladesh.

**Methods:** We defined moderate-to-severe diarrhoea (MSD) if any of the following was present - sunken eyes and/or wrinkled skin and/or visible or reported blood in stool; or a child was hospitalized with diarrhea or dysentery; or a child needed intravenous rehydration. Children under 5 years without any signs of MSD constituted as mild diarrhea (MD). Malnutrition was considered as presence of any of the indices such as stunting (HAZ < -2SD), or wasting (WHZ < -2SD), or underweight (WAZ < -2SD).

**Results:** From January 2010 to December 2011, 2,324 children >5 years with diarrhoea were enrolled from the demographic surveillance system (DSS) catchment area; of them 651 (29%) were malnourished [MSD, 335 (51%); MD, 316 (49%)]. Among the well nourished children, 475 (36%) constituted as MSD and rest were MD. MSD children were at higher risk for malnutrition compared to children with MD [57% vs. 45%; OR (95% CI); 1.76 (1.45, 2.13), p<0.001]. In multivariate analysis, age of the child (24-59 months) [OR (95% CI); 2.09 (1.31, 3.33)], non sanitary toilet facility [2.20 (1.07, 4.51)], fever [1.81(1.13, 2.88)], abdominal pain [2.27 (1.41, 3.65)], straining [4.97 (3.30, 7.49)], and infection with *Shigella* [2.77 (1.58, 4.87)] stood as risk factors for MSD; whereas, other pathogens such as rotavirus [0.56 (0.36, 0.87)] and ETEC [0.28 (0.10, 0.74)] were not detected as predictors for MSD among the malnourished children. Among the well nourished children, age (24-59 months) [1.44 (0.99, 2.09)], fever [1.75 (1.23, 2.51)], abdominal pain [1.74 (1.22, 2.48)], straining [6.09 (4.51, 8.23)], and infection with *Shigella* [4.03 (2.58; 6.30)]; while, rotavirus [0.39 (0.28, 0.55)] was protective for MSD cases.

**Conclusion:** Older children with abdominal pain and straining and concomitant infection with *Shigella* were associated with MSD taking not into consideration nutritional status of the rural children in Bangladesh.
Abstract # 40

Studies on antimicrobial activity of Perionyx excavatus extract against responsible pathogen (Group A β-haemolytic streptococcus) for Rheumatic fever in perspective of Bangladesh

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Introduction: The epidemiological association between group A β-haemolytic Streptococcal infections and the subsequent development of acute rheumatic fever (RF) has been well established. Rheumatic fever is still the most common cause of heart disease in children and young adults in developing countries like Bangladesh.

Objectives: The antimicrobial activity of vermiextract (Perionyx excavatus) was assessed against some human pathogenic microorganisms, especially strains of group A β-haemolytic Streptococcus for Rheumatic fever in perspective of Bangladesh.

Methods: The present investigation deals with particular microorganism causing for Rheumatic Fever (RF) along with other five Gram positive bacteria Bacillus megaterium, Bacillus cereus, Bacillus subtilis, Staphylococcus aureus, and Sarcina lutea. Earthworm, Perionyx excavatus were collected from the Raja Bari dairy farm of Rajshahi and the bacterial strains were collected from the environmental Microbiology laboratory of ICDDR, B for the study. Ethanol, methanol and chloroform were used as solvents for extraction of P. excavatus tissue, among them ethanolic extract was the most effective against group A β-haemolytic Streptococcal bacteria. The effectiveness of the vermiextracts was compared and evaluated with standard antibiotic disc in the Environmental Microbiology laboratory at Institute of Environmental Science (IES), Rajshahi University.

Results: The zone of inhibition ranged from 15-18mm in diameter against 1.0 × 10⁸ cells of each culture at 1mg concentration of the P. excavatus extract. The MIC (Minimum Inhibitory Concentration) was estimated by microdilution method.

Conclusion: It is expected that the findings of the experiment may be useful to engender new biomedicine for Rheumatic Fever (RF) and Rheumatic Heart Diseases (RHD).
Abstract # 21

**Success and Challenges of Tuberculosis Control in Bangladesh**

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**Introduction:** Tuberculosis is a major public health problem in Bangladesh since long. With about 340,000 new cases annually, the country ranks sixth among the 22 high TB burden countries in the world. To combat the problem, Bangladesh introduced DOTS strategy in 1993, and has been implementing Stop TB strategy since 2006; aiming to build on and enhancing DOTS to meet the TB related MDG. Additional emphasis has been given on diagnosis and management of smear negative and extra-pulmonary TB, childhood TB as well as drug resistant TB through Stop TB strategy. Country-wide free- of-cost TB diagnosis and treatment services have been made available through 850 DOTS centres and 1058 Microscopy labs.

**Objectives:** To determine the success and challenges to tuberculosis control in Bangladesh.

**Methods:** Review of existing records from the programme office.

**Results:** The NTP has crossed the targets of 85% treatment success and 70% case detection by 2003 and 2006 respectively and have been maintaining over 90% treatment success rate for the last 5 years. The program is gradually progressing towards achieving the TB related MDG targets of halving TB death and prevalence. Strong political commitment and unique collaboration between government and non-government allied organizations are the keys to the success of TB control in Bangladesh. Despite the successes, there remains still few challenges in TB control including: sustaining the achievements maintaining high quality in diagnosis and treatment of TB cases, health system strengthening in TB care, scaling up of programmatic management of drug resistant TB cases, capacity building for diagnosis and management of childhood TB and extrapulmonary TB.

**Conclusion:** Focus directed towards achieving adequate management of drug resistance, building local capacity to enhance response and ensuring sustainability of TB control programs could enhance TB control and prevention in Bangladesh.
Abstract # 30

A Step forward to Combat Medication Errors

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Introduction: Medication error has been quite a severe problem in Bangladesh but few successful measures have yet been taken. Apollo Hospitals Dhaka, made an attempt to fight this issue head on to improve existing scenario of medication errors. Apollo Hospitals adopted a multi-pronged strategy and redesigned process to effectively reduce medication error rate to 2.79%.

Objectives: To reduce medication errors within international standard (benchmark below 2%).

Methods: A cross-sectional study was done (January 2011-October 2012) to analyze reasons for medication errors.

Results: For this purpose the entire medication system of Apollo Hospital Dhaka was redesigned starting from prescribing, indenting, documenting, administering, storing, handling, labeling to reporting. The staffs were educated and trained. The strategies followed by the hospital included: (1) prescription review for appropriateness before dispensing as per Joint Commission International USA guideline, (2) CPOE (Computerized Physician Order Entry) to reduce confusion due to illegible writing, (3) rational use of antibiotics, (4) unit-dose dispensing to decrease chances of administration error, (5) chemo-admixing by pharmacist under laminar hood, (6) high-alert medications, (7) medicine reconciliation to minimize dosing errors, omissions or duplication of therapy, (8) auxiliary label to decrease patient’s confusion on medicine use, (9) syringe labeling to reduce error in OT and critical area, (10) ADR Monitoring, (11) introduction of drug information software. With cooperation of all health care professionals, medication error rate has been successfully reduced to 2.47 % from 13 %.

Conclusion: Maintaining medication error within bench mark is a huge challenge for a hospital. But it is only possible by combined effort of Hospital Administrator, Physicians, Pharmacists and Nurses. It can also be implemented in other healthcare hospitals by adopting the same strategies.
Abstract # 44

**Insufficiency of Drainage and Sanitation System of Rajshahi City: Impacts on Human Health**

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**Introduction:** Rajshahi city, a divisional head quarter of Bangladesh has severe drainage and sanitation problem for a long time. Particularly the sanitation system of this city is in sordid condition. As a result a lot of problems including disease spreading, water logging, waste disposal and sewage are found in this city which has a harmful impact on health of city dwellers. Especially air and water borne contagious diseases are spreading at an alarming rate in this city.

**Objective:** This study area has been selected in order to find out the types of impact on human health of the city due to lack of its drainage and sanitation system and to find out the existing problems of drainage and sanitation system, its causes and to provide proper recommendations to get rid from these problems of Rajshahi city.

**Methodology:** Data have been collected through a cluster sampling survey with a relevant questionnaire among the 30 wards of the Rajshahi City Corporation. The collected data have been categorized using SPSS 12.5 method and analyzed them in the measurement of spatial variation. The required maps have been prepared using Arc View 3.2a. Water sample of study area has been tested to evaluate the quality and to know the problem of them.

**Results:** The primary findings revealed that drainage and sanitation facilities of the study area are not sufficient and planned. Due to lack of proper drains and dustbins, the waste management system is also not satisfactory. Water logging problems exist in Terokhadia, Santitola sarak, Laxmipur, rail crossing, Padma residential area, Hatemkhan, Sreepur, Begamganj and Sosthitala area for want of proper drainage system. Drainage and sanitation system is almost absent in some highly populated slum and peripheral areas of the city which imposes a direct impact on human health especially children and also environment. Some drains are blocked and they turn into mosquito breeding zone.

**Conclusion:** It is essential to ensure sound drainage and sanitation system in the whole area of the city to keep the city livable. Proper planning and sufficient drainage system of a city can ensure sound environment.
Abstract # 22

**Using online social networks for increasing health literacy on oral health**

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**Introduction:** Oral health is often a neglected area for raising awareness. Not only general population, but also students belonging to healthcare profession suffer from lot of confusions regarding oral health. With the advent of the ubiquitous online social networks like the Facebook, many people have started spending more time in the cyberspace.

**Objective:** This study was aimed to explore the different aspects of online interactions on oral health among the Internet users – both dental professionals as well as non dental professionals – and their opinion about online interactions as a source of oral health knowledge.

**Methodology:** A descriptive study was conducted among the Oral Health group members in Facebook through the Internet. The study was divided into two parts. First part included content analysis of Oral Health group interactions during the period of July 2011 to April 2012 and second part included online survey findings. All the postings and their discussions in “Oral Health” group were collected and analyzed by using both qualitative and quantitative methods. Total 427 group members were included, 65.84% members were recruited by administrator (admin) and 34.16% by other members of Oral Health group.

**Results:** Among the group members 110 (23%) members were actively participating in group interactions. A total of 384 interactive messages were exchanged between the group members on 194 separate topics (on average 2 messages exchanged per topic). The flow of group interactions mostly occurred between dental professional and dental professional (78%), followed by general and general (3%), dental professional and general (9%), general and dental professional (10%). Opinion of survey respondents about the oral health group online interactions were found as “Appreciative” (52%), “Modern technology of learning is useful” (34%), “Improves clinical knowledge of professionals” (26%), “Improves oral hygiene knowledge and practice” (22%), “Helps to solve oral health problems” (38%).

**Conclusion:** Online oral health group appears to be an effective platform sharing information, experiences and advices on oral health among the Internet users.
Abstract # 28

**Knowledge regarding adiposity in urban adolescent students**

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**Introduction:** Adiposity is an increasing prevalent nutritional disorder among adolescent in both developed and developing countries.

**Objectives:** The aim of this study was to find out the prevalence of adiposity and to assess the knowledge regarding and attitude towards adiposity among the adolescent students in Dhaka city.

**Methods:** A cross sectional study was conducted in purposively selected four secondary schools in Dhaka city from July 2011 to June 2012 and on 450 students including both sexes from class six to eight. A semi-structured, pre-tested, self-administered questionnaire was used for collection of data on knowledge and attitude related variables. Levels of knowledge were categorized as “Poor” and “good” and attitude were measured by using a 5-point Likert self-rating scale. Anthropometric measurements were taken for three points (triceps, subscapular and calf) skin fold thickness. Percentage of body fat mass was calculated and classified into four categories: low, mid, upper and obesity.

**Results:** Percentage of body fat of 10% students was at obesity level. Among boys, 13.2% had obesity level percent fat mass while 4.5% of girls were at that level. Among the respondents 77.3% had poor knowledge whereas 22.7% had good knowledge regarding adiposity. Among the participants, 10.8% having percentage of body fat at obesity level had good knowledge regarding adiposity and 7.2% of the participants having percentage of body fat at obesity level had poor knowledge. Among the respondents 68.7% had poor attitude whereas 31.3% had good attitude towards adiposity. Among the participants, 10.6% having percentage of body fat at obesity level had good attitude towards adiposity and 10.0% of the participants having percentage of body fat at obesity level had poor attitude.

**Conclusion:** The prevalence of adiposity in adolescent students in Dhaka city is high. Knowledge level of the adolescent students regarding adiposity was not satisfactory and attitude towards adiposity was also not encouraging. This study might help the policy makers in understanding the burden of adiposity in Bangladesh.
Abstract # 34

**Hand Washing Knowledge and Practices among School Children in Bangladesh**

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**Introduction:** The high incidence of diarrhoeal diseases and other communicable diseases among children due to poor personal hygiene remains a concern on the public health agenda in most countries.

**Objectives:** To address the problem efficiently, the study was undertaken to determine hand washing knowledge and practices among school children of Dhaka city in Bangladesh.

**Methods:** It was a cross sectional study amongst 273 school children studied in class VI and VII in two selected schools of Dhaka. Data were collected by pretested structured questionnaire on November 2012 and analyzed by appropriate univariate as well as multivariate analysis.

**Results:** The Mean±SD of the total score (expressed as percentage) of knowledge was 36±11 and practice was 36±9 of the study subjects. Knowledge score on necessity of hand washing determined low (37%). Knowledge score (42%) on appropriate timing of hand washing found more than practice score (37%). Although most of the children (94%) found complete knowledge on appropriate hand washing materials but they did not practice hand washing properly due to unavailability of soap in school. On the other hand, in their home, they practiced hand washing properly due to presence of hand washing facilities. No children had complete knowledge on hand washing techniques which also reflected in their practice. The Mean±SD of age of children was 12±1 and most of them (81%) were from single family. These variables were found to be significantly associated with total knowledge score (p<0.001) and practice score (p<0.001) by linear regression analysis. There was also found significant positive correlation between knowledge and practice (r/p=.177/.001).

**Conclusion:** There is still lack of knowledge and practices on hand washing among school children. Implementation of interventional hand washing program for behavior change with continuous monitoring and performance feedback and make available of hand washing facilities in school is important for improving effective hand washing practices.
Abstract # 35

A Comparative Study on the Infant and Young Child Feeding Practice and Nutrition Status among 0-23 Months Age Group Children in Nutrition Intervention and Non-Intervention Area

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Introduction: Child nutritional status is an essential component of a country’s overall human development. Inappropriate feeding practices are linked with the problem of malnutrition, overweight and obesity that may develop beyond the age of 2 years.

Objectives: The present study was aimed to assess the Infant and Young child feeding practice and nutrition status among 6-23 months age group children in nutrition intervention and non-intervention areas.

Methods: It was a comparative cross-sectional study of 350 subjects among age group of 6-23 months children. Anthropometric data were collected by standard techniques. Nutritional status was measured using Z score according WHO classification. χ² test, independent t test, Pearson’s correlation, Multiple regression and logistic regression was performed as P<0.05 level of significance.

Results: Initiation of breast feedings within an hour of birth were 68% and 59.4% among NNP and non-NNP (P<0.000) area. Pre-lacteal feed were 34% in NNP and 37% in non-NNP area. Exclusive breast fed were 54.3% and 44% in NNP and non-NNP area (P<0.034) respectively. It was found that appropriate complementary feeding practice were 51.4% and 38.9% in NNP and non NNP area. In NNP area, severe wasted, stunted and underweight was 3.42%, 6.28% and 10.28% respectively. In Non-NNP area, severe wasted, stunted and underweight was 8.0%, 16.0% and 18.9% respectively. Significant difference was found between NNP and non-NNP areas of Initiation of breast feeding (P<0.000), exclusive breast feeding (P<0.034) and complementary feeding practice (P<0.034). In Pearson’s correlation there was found positive relationship between NNP and non-NNP area according to mean intake of energy, carbohydrate and fat was (p=0.000), (p=0.021) and (p=0001) respectively.

Conclusion: The study revealed that the Infant and Young Child Feeding practice and nutritional status are better in nutrition intervention area than non-intervention area. Appropriate feeding practice play an important role on their good nutrition status
Abstract # 36

**Feeding Pattern and Nutritional Status of Under Two Years Slum Children**

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**Introduction:** Feeding practices play a pivotal role in determining the optimal development of infants. Breastfeeding is the first immunization for the infant. Breastfeeding, especially exclusive breastfeeding (EBF), is one of the most effective preventive health measures available to reduce child morbidity and mortality. Through this study the information helps to make planning to decrease malnutrition and way of proper feeding in reaching the target of MDG -4.

**Objectives:** To assess feeding pattern and nutritional status of less than two years aged children living in slum.

**Methods:** This cross sectional descriptive study was carried out in several slums of Dhaka City Corporation from January to June 2010. The study included 125 apparently healthy children and their mothers as respondents. The samples were selected purposively. Data were collected through face to face interview of the respondent with pretested semi-structured questionnaire. Nutritional status of the study population were measured with length for age Z scores, weight for age Z scores and weight for length Z scores.

**Results:** Nutritional status of the children was in <-3SD including 17.4% stunting, 19.1% wasting and 24.3% underweight. One twenty (96%) respondents fed their child colostrum; fifty four (45.0%) respondents initiated breastfeeding within one hour of birth. Hundred five (84%) respondents fed their child pre-lacteal feeding. Twenty (16%) respondents fed their child exclusive breastfeeding for 6 months. Eighty (64%) respondents fed their child complementary feeding at the age group 6-7 months. Common types of complementary feeding were family feeding, rice gruel with milk and *khichuri*.

**Conclusion:** The data suggest that exclusive breastfeeding rate was still very low. Complementary feeding had bizarre pattern. Considering the poor nutritional status, the study recommends intensive programs and interventions for the promotion and protection of feeding pattern and practices and thereby nutritional status of slum children.
Abstract # 47

**Nutritional status among primary school children in Sreepur Upazila under Gazipur District**

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**Introduction:** *A World Free from Hunger Report* states that the approximate prevalence of stunting for all developing countries is 29% of all children. According to UNICEF report (1995-2003) underweight children are the most prevalent problem in Bangladeshi children.

**Objectives:** To assess the nutritional status (incidence of stunting and wasting) of primary school children of rural areas.

**Methods:** A cross-sectional study was conducted in two primary schools located in Sreepur Upazila. The schools were selected using purposive sampling technique. In total, 345 students studying from class IV to V were enrolled in the study. Information on food and nutrient intake and anthropometric measurements (age in years, height in cm, and weight in Kg) of each child were taken to assess their nutritional status.

**Results:** There was low intake of cereals, pulses, fruits, milk and milk products and green leafy vegetables. The percent adequacy of energy and protein and vitamins and minerals intake was found to be about half (50% and 54%) of the Recommended Dietary Allowances. The mean height of children was (136.9 cm; SD±8.57cm) and mean weight (27.18 Kg; SD ± 6.78kg) were not comparable with National Centre for Health and Statistics (NCHS), USA. Underweight, stunting, and wasting were present in 40.2%, 57.98%, and 23.77% children, respectively. Being underweight was associated with lower household wealth ($p < .05$). Among 40% underweight rural school children the percentage of underweight girls (47.62) was found to be higher. Undernourished were 81.74% students. The students were more stunted (57.98%) than wasted (23.77%).

**Conclusion:** The study revealed that large proportion of primary school students was malnourished. Initiation of school health program with specific emphasis on prevention of diseases, improvement of personal hygiene and nutritional status with the collaboration of governmental and non-governmental institutions could improve the nutritional status of school children.
Abstract # 12

**Antioxidants in combating morbidities among underprivileged preschool children**

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**Introduction:** Antioxidants protect the body from cellular damage by combating oxidative stress.

**Objectives:** To find out the combined effects of antioxidants on morbidity status of preschool children in three selected Government Primary Schools in Dhaka city.

**Methods:** It was a double blind interventional study. Both interventional and control groups were well matched in respect of socio-economic and demographic parameters. A cup with 100gm of ice cream was fortified with antioxidants such as β-carotene, vitamin E, vitamin C and zinc for daily consumption for the interventional group in the doses of 2000 microgram, 6mg, 30 mg and 10 mg respectively. The control group was provided with the same ice cream without fortification.

**Results:** It showed the baseline serum levels of beta-carotene, vitamin E, vitamin C and zinc for interventional group (n=117) as 5.11mcg, 307.69 mcg, 0.16 mg and 0.52 mg respectively. In control group (n=104) the same was found to be 5.29 mcg, 330.52mcg, 0.14 mg and 0.52 mg respectively. After the intervention for a period of 6 months, the interventional group had serum levels for β-carotene, vitamin E, vitamin C and zinc as 22.64mcg, 938.27mcg, 0.96mg and 1.11mg (p-value <0.0000) and control group had the same as 4.80mcg, 326.50mcg, 0.15mg and 0.53mg respectively. At the end of intervention the morbidity state in interventional group was found as low appetite-105, cured-100; anaemia-81, cured-69; gum bleeding/hypertrophy-17, cured-14; wasting of subcutaneous fat-15, cured-13; fatigue-11, cured-10; (p-value <0.0001). But in control children it was found as low appetite-99, cured-8; anaemia-74, cured-15; gum bleeding/hypertrophy-25, cured-4; wasting of subcutaneous fat-10, cured-1; and fatigue-13, cured-2; and the changes were not significant.

**Conclusion:** Fortification of staple foods with essential antioxidant micronutrients may be an important tool to improve the nutritional status of the children contributing to a healthy and productive nation.
Abstract # 15

**Nutritional status of children aged 5-14 years in selected arsenic exposed and non-exposed areas in Bangladesh**

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**Introduction:** The threat to public health by arsenic contamination in drinking water has attracted much attention since the 1990s, largely due to the scale of the problem in Bangladesh which was described as “the largest poisoning of a population in history”. A WHO report predicted that in most of the southern parts of Bangladesh almost 1 in 10 adult deaths will be a result of cancer triggered by arsenic poisoning in the next decade.

**Objectives:** To assess and compare the nutritional status of children aged 5-14 years in arsenic exposed and non-exposed areas.

**Methods:** A cross sectional study was conducted on 600 children of age 5-14 years from arsenic exposed and non-exposed areas in Bangladesh. Designed questionnaire and checklist were used for collection of data. To estimate BMI, necessary anthropometric measurements of the studied children were done. Dietary intakes of the study children were assessed using 24-hours recall method.

**Results:** The difference of socio-economic conditions between the children of exposed area and non-exposed area was not significant. On an average the body mass index was found to be significantly (p<0.01) lower among the children of arsenic exposed area (49%) in comparison to that of children in non-exposed area (38%). Stunting (p<0.01), wasting (p < 0.05) and underweight (p < 0.05) were significantly higher in exposed group in comparison to non-exposed group. No significant difference of nutrition intake was found between exposed and non-exposed children as well as thinness and normal children. Adjusting the influences of the control variables it was seen that undernutrition was more among the study children with arsenic exposure than the arsenic non-exposed children. The exposure-effect was found to be significantly associated (p< 0.01).

**Conclusion:** In this study children exposed to arsenic contaminated water were found to suffer from lower nutritional status.
Abstract # 38

**Study on knowledge of bronchial asthma and assessment of airway condition by peak flow meter in a rural community in Bangladesh**

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**Introduction:** Bronchial asthma is one of the commonest multi-factorial chronic diseases. The worldwide incidence of asthma is increasing in frequency and severity day by day. Bangladesh being a developing country of South East Asia, majority people live in rural community below poverty line, with a high population density. In addition to low socioeconomic status and lack of literacy, the occurrence of asthma is increasing.

**Objectives:** To determine the knowledge of bronchial asthma and assessment of airway condition by peak flow meter.

**Methods:** A cross sectional study was conducted in the rural areas of 4 unions of Palashbari Upazilla of Gaibandha District. A total of 950 males and females of 18 years and above were selected purposively as respondents. Data were collected by pre-tested questionnaire and carried out from 7 March to 7 April, 2011.

**Results:** Partial knowledge about asthma was 64%, while 36% had no knowledge at all. While 34.5% said heredity had an impact in the occurrence of asthma and 26% said germ was the possible cause, 40% said asthma was an infectious disease, 68.5% gave opinion in controllable and 31.5% stated that it was curable, 68% had no idea about inhaler medication. Regarding triggering factor, 31% blamed damp weather and common cold and 23% said dust smoker was 43%. PEF (Peak Expiratory Flow) revealed that 69% had above 80% of predicted value.

**Conclusion:** Rural people of Bangladesh have little knowledge about asthma. We hope that these findings would be helpful for planning measures for raising community awareness for asthma in rural Bangladesh.
Abstract # 18

**Cardiovascular risk factors among type 2 diabetics attending selected diabetes care facilities in Bangladesh**

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**Introduction:** Cardiovascular diseases are responsible for the majority of deaths in diabetic patients and there are many risk factors for CVD.

**Objectives:** The study aimed to assess the proportion of cardiovascular risk factors among diabetic subjects attending different diabetes care centers at the capital city and in northern Bangladesh.

**Methods:** Under an analytical cross-sectional design 754 type 2 diabetic subjects (age >20 years) were selected from different diabetic centers situated in the capital city and northern part of Bangladesh. Sampling was done by selecting each alternative subjects attending the OPD of the selected centers. Data were collected using a pre-tested, interviewer-administered questionnaire. Anthropometric measurements were done by using appropriate tools; clinical and all biochemical data were collected from the treatment guide book of the patients. Diagnostic criteria for CVD risk factors are adopted from American Diabetic Association (ADA) and World Health Organization (WHO).

**Results:** The proportion of hypertension, overweight and obesity, waist circumference, dyslipidaemia, physical inactivity, betel quid consumption and current smoking was 26%, 74.7%, 77.2%, 52.9%, 18.2%, 28.1% and 10.3% respectively. Among the 402 participants for whom all measurements were available, 1% had at least one of the six risk factors (hypertension, overweight & obesity, waist circumference, dyslipidaemia, smoking and physical inactivity). Only 5% had two risk factors while 20% had 3 and 25% had 4 risk factors. On logistic regression no predictors were found to be associated with hypertension.

**Conclusion:** Overweight and obesity, waist circumference and dyslipidaemia were common while current smoking is comparatively uncommon among diabetic subjects. Habitat and male gender are predictors of obesity and males are more likely to develop central obesity and dyslipidaemia. Focused attention is needed for screening and management of these risk factors.
Abstract # 54

Metabolic syndrome in Bangladesh using NCEP Adult Treatment Panel III criteria

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Introduction: Metabolic Syndrome (MetS) had become a growing concern for the developed countries associating cardiovascular and other endocrine risks. But in Bangladesh, there is no general information about the prevalence and risk factors as most of the studies are area, gender or disease specific.

Objectives: To assess the prevalence and factors associated with metabolic syndrome (MetS) in Bangladesh.

Methods: Cross-sectional study on 341 urban and 149 rural respondents through simple random sampling. The socio-epidemiologic factors were studied with anthropometric examination, blood pressure recording and fasting blood for analysis of triglyceride (TG), high density lipoprotein (HDL), fasting blood sugar (FBS).

Results: Prevalence of MetS was 38.78% with rural (49%) and male (54.17%) prevalence being higher than urban (34.3%) and female (26.64%) respectively. Low HDL cholesterol prevailed in almost 96% respondents followed by high TG (51%), obesity (27.96%), high FBS (27.14%) and hypertension (HTN, 16.94%). On logistic regression, age (OR=1.60, 95% CI: 1.31-1.95) and male sex (OR=2.54, 95% CI: 1.36-4.75) were associated with high risk of MetS; sedentary occupation (OR=1.72, 95% CI: 0.98-3.02) and rural area (OR=1.4, 95% CI: 1.0-2.1) were just significantly associated. Though higher income, better education, good physical movement and knowledge of MetS produced protective odds, they were not significant.

Conclusion: MetS is highly prevalent in Bangladesh with dislipidaemia being alarmingly high. Preventive measures like health education and mass campaign regarding the factors can improve the situation in future. Moreover further studies are needed to identify the risk factors for adopting effective preventive measures.
Authors list

Abdullah, S A H M A 24 Debnath, N C 12, 14
Adhikary, M 44 A K, Erbsoll 13
Afnan, F 48 Faruque, A S G 16, 23, 31, 32, 33, 34
Ahmad, S A 46 Farzana, F D 16, 23, 33, 34
Ahmed 39 Ferdous, F 16, 23
Ahmed, F 11 Ferdous, F 33, 34
Ahmed, S 10, 16 Finkelstein, E 6
Ahmed, S 23, 33, 34 Flora, M S 24, 26, 27, 40
Ahmed, T 16, 23, 32, 33 Furuya, H 49
Akhtar, K 43 Ghosh, D 30
Akhter, R 47 Giasuddin, M 12
Alam, M 20 Gope, P S 22
Alam, S M R 47 Gummow B 12
Alamgir, A S M 22 Gurley, E S 29
Ali, L 25, 41, 48 Haaland, B 6
Alif, S M 45 Haider, N 11
Amin, M N 36 Halim, A 7
Anisuzzaman 28 Halim, M A 21
Ara, F 48 Haque, F 14, 22
Azad, M A M 35 Haque, F 47
Banu, B 41 Haque, M A 36
Banu, N N 15 Haque, M E 12
Bardhan, P K 31 Haque, R 20, 30
Bari, M 47 Hasan, S M M 22
Baru 25 Hassan, M M 12
Begum, Y A 16, 23, 33 Hoque, A 42
Bhaskar, K R H 30 Hoque, M A 12
Bhattacharya, S K 30 Horner, R 20
Bhuiya, A 1 Hussain, M Z 12
Billah, S M B 49 Hussain, S 47
Biswa, A 7, 21 Hussain, S J 4
Bose, P P 29 Hussain, S M 45
Bose, S 6 Huda, M M 30
Brun, E 12 Husain, M A 36
Burgess, G 12 Husain, M M 14
Chisti, M J 16, 23, 31, 32, 33, 34 Iqbal, M 8
Chowdhury, R 30 Islam, A 5, 12
Chowdhury, S 12, 13 Islam, A 28
Chowdhury, S N 8 Islam, M S 22
Das, P 29 Islam, N 7
Das, S K 16, 23, 31, 32, 33, 34 Islam, S K M A 12
Dash, A P 30 Jahan, M S 35, 49
Jahan, S N 40  Rahman, M 14, 22
Jesmine, S 49  Rahman, M 16, 23, 33
Joarder, T 5  Rahman, M H 28
Karim, M R 46  Rahman, M M 36
Keobouahome, B 49  Rahman, M M 38
Khan, M H 29  Rahman, M R 35
Khan, M S U 11  Rahman, M S 3
Khan, S A 12  Rahman, M Z 11
Khanom, K 41  Rahman, M, R 38
Khatun, A 22  Rahman, Z M M 12
Khatun, T 42  Raqib, R 31
Khurshida, K 39  Rasheed, S 8
Kinoue, T 49  Rashid, I 9
Kundu, S K 22  Rashid, S F 18
Latham, J R 16, 23, 33  Rowsan, A 44
Linnan, M 4, 6, 19  Rudra, S 30
Luby, S P 11, 22  Rumana, A 39
Mahmud, A 37  Salam, M A 31, 32
Malek, M A 31, 32  Saleh, F 48
Manandhar, M 9  M, Sandberg 13
Mashrekly, S R 4, 6, 19  Sarbadhikari 39
Matabbar, M S 42  Sardar, S A 28
Mecrow, T 4  Sarker, M R 42
Mikolon, A B 11  Scarr, J 4
Monalisa 26  Shafinaz, S 19
Mondal, D 20, 30, 32  Shaikat, A H 12
Mumu, S J 40, 48  Skerratt, L 12
Nesha 39  Snider, C 20
Nozib 20  Solaiman, S M 27
Paul, M 12  Sultana, R 15
Paul, S K i, x, 11  Sultana, S 40
Petri, W A 20  Svanström 19
Qadri, F 16, 23, 33  Talukder, K A 16, 23, 31, 33
Rahim, M A 11  G E, Themudo 13
Rahman, A 4, 6, 19  Tun, H M 12
Rahman, A 17  Uddin, A 5
Rahman, A K M F 21  Vellemen, Y 10
Rahman, A S M M 45  Watanabe, T 49
Rahman, F 4, 6, 7, 19  Watanabe, Y 49
Rahman, F 25  Yamage, M 12