Rabies Control Projects in Bangladesh: Current Efforts by *Global HealthShare* (GHS) Initiative and *Humanity Beyond Barriers* (HBB)

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Bangladesh

Location: Southern Asia, latitude 23° N and longitude 90° E, bordering with India and Myanmar, Bay of Bengal in south.

Area: total: 144,000 sq km
land: 133,910 sq km
water: 10,090 sq km
Coast line: 580 km

Climate: tropical; mild winter (October to March); hot, humid summer (March to June); humid, warm rainy monsoon (June to October)

Terrain: mostly plain; hilly in southeast, coastal area in southern part

Natural resources: natural gas, arable land, timber, coal

Land use: usable land: 62.11%
permanent crops: 3.07%
other: 34.82% (2001)

Irrigated land: 38,440 sq km (1998 est.)

Natural hazards: droughts, cyclones; flood mostly
Population: ~163 million (2016 est.)
Growth rate: 1.6% (2015 est.)
Birth rate: 21.14 births/1,000 population (2015 est.)
Death rate: 5.61 deaths/1,000 population (2015 est.)
Life expectancy: 71 years (WHO, 2015)
  Male: 71 years
  Female: 73 years
Infant mortality rate: 33.2 deaths/1,000 live births (2016)
Literacy: 71% (2014)
Bangladesh Economy

- Lower-middle-income economy
- Developing country, in ‘Next 11’ (N-11) country list from economic forums.
- GDP: ~$1,600 per capita (PPP: ~$4k) [2017]
- GDP growth: ~7.0%
- Extreme poverty still exist but garment industry and robust NGO sector helped extreme poverty down, currently to ~14% [2017]
Bangladesh Economy/Health

• Poor health system, most people do not have access to safe and affordable preventive care/treatment.
• 3.5% of GDP (7.9% of total budget) (2009) govt. spent. Out of pocket >95% of health care expenditures, mostly by informal providers (2009)
• Village ‘doctors’ (little or no formal training) treat >60, harmful and inappropriate drug prescription widespread. There are local ‘healers’ for traditional and superstitious ‘treatment’
Neglected diseases of the poor

Neglected Tropical Diseases

- Soil Trans Helminth
- Schistosomiasis
- LF
- Onchocerciasis
- Trachoma

- Leish, ...

Neglected zoonoses

- Anthrax
- Bovine tuberculosis
- Brucellosis
- Zoonotic trypanosomiasis

Affect more than 1 billion people in 149 countries
Presence of Rabies

- Claims 55,000 human lives annually worldwide
  - Asia 31,000 (56%)
  - Africa 24,000 (44%)
- Takes away live in every 10 minutes
- Most victims (>80%) are Children
- More than 95% due to dog bite
- In the absence of post-exposure prophylaxis, about 327,000 persons would die from rabies in Africa and Asia each year (WHO, 2010)
Burden of rabies in neighboring countries of Bangladesh

Deaths and Post-exposure treatment due to animal bite

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated Death/year</th>
<th>Estimated post-exposure treatment /year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>2,100</td>
<td>300,000</td>
</tr>
<tr>
<td>India</td>
<td>18,000-20,000</td>
<td>1,100,000</td>
</tr>
<tr>
<td>Nepal</td>
<td>200</td>
<td>25,000</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>133</td>
<td>80,000</td>
</tr>
<tr>
<td>Thailand</td>
<td>74</td>
<td>200,000</td>
</tr>
</tbody>
</table>
Bangladesh situation

- Rabies remains one of the Neglected Tropical Zoonotic Diseases (NTDs) of extreme poor
- Rabies death ~2,100/year (2011)
- 300,000 people is getting Post-exposure treatment (PET) each year, 85% are from rural areas.
- Unknown numbers of livestock die of rabies every year

Cases are vastly under reported
Bangladesh situation - Distribution of rabies cases by animal bite

<table>
<thead>
<tr>
<th>Bitten by</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog</td>
<td>89</td>
<td>90.8</td>
</tr>
<tr>
<td>Cat</td>
<td>8</td>
<td>8.2</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>100</td>
</tr>
</tbody>
</table>
Bangladesh situation - Distribution of rabies cases by site of bite

<table>
<thead>
<tr>
<th>Site of bite</th>
<th>frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above knee</td>
<td>16</td>
<td>16.3</td>
</tr>
<tr>
<td>Below knee</td>
<td>50</td>
<td>51.0</td>
</tr>
<tr>
<td>Finger</td>
<td>5</td>
<td>5.1</td>
</tr>
<tr>
<td>Above elbow</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td>Below elbow</td>
<td>10</td>
<td>10.2</td>
</tr>
<tr>
<td>Chest</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td>Belly</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Back</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Neck</td>
<td>5</td>
<td>5.1</td>
</tr>
<tr>
<td>Face</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>100</td>
</tr>
</tbody>
</table>
Estimated Dog population in Bangladesh

<table>
<thead>
<tr>
<th></th>
<th>No. of Pet dogs</th>
<th>No. of Stray dogs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>212,421</td>
<td>995,067</td>
<td>1,228,217</td>
</tr>
</tbody>
</table>

Central Hospital (IDH) retrospective data on animal bites: victim gender

- According to a report of Infectious Disease Hospital (IDH), Dhaka from Jan 2004 to Dec 2008 (total animal bite cases 149,439 at IDH)
- Sixty-five percent of those deaths were children under 15 years.
- Male 77.6% and Female 22.4%
Mostly affected Capital city Dhaka and its Surroundings

Distribution of animal bite cases from 2004-2008 attending at IDH

. Distribution of rabies cases from different districts of Bangladesh attending at the Infectious Disease Hospital, Dhaka, Bangladesh. Most of the patients were from Dhaka and surrounding districts.
Human rabies control: Bangladesh situation

- Post Exposure Prophylaxis (PEP): 1 central hospital until 2010, over crowded, underserved, short supply of vaccine not uncommon.
- Subsidized Nerve Tissue Vaccine (ended 2010)
- Cell Culture Vaccine (CCV): introduced in 2011, free of cost for bite victims.
• **Strategic plan (2011):** post bite management, mass vaccination of dogs, advocacy, communication and social mobilization and thereby end human rabies cases by 2020.

• Setup 68 rabies prevention unit at district level

• Dog ‘catch and kill’ – banned

• CNVR (pilot scale) initiated

• Mass dog vaccination program initiated
Activities done by Govt Human Health Services (DGHS)

- Use of Cell Culture Vaccines for Intra-dermal use as per National Guidelines
- Training of doctors and nurses on rabies control and IDTCV vaccination
- Pilot study on surgical and chemical sterilization of dog at Raipura Upazila under Narsingdi district in collaboration with IACIB.
- Advocacy and Social mobilization in different districts.
- Dog immunization in different districts with support from FAO.
Roles and responsibilities of Govt Livestock Services (DLS)

- Animal population control
- Immunization of pet and stray dog population
- Ensure availability of animal rabies vaccine
- Establishing effective surveillance system to understand incidence of rabies in animal
- Improve health and welfare of pet and stray dog population
- Strengthen rabies diagnostic facilities at national and field lab.
- Strengthen public awareness and motivational activities
Roles of Local Govt (LGRD)

■ Post exposure management of animal bite cases
■ Pre-exposure vaccination of at risk population those who handle dog and other animals at slaughter house
■ Management of dog population by-
  ● Registering canine pets.
  ● Cooperate DLS for vaccination of dogs
  ● Ensure PEP in human with their departmental fund .
  ● Eliminating suspected rabid dog
  ● Immunization of stray dog population
  ● Animal Birth Control
■ Help in updating relevant laws and regulations for rabies control in coordination with MOH and LSD
Rabies remains endemic in Bangladesh today
No known evidence to date that the current govt. programs so far met the target hard immunity even in defined localized field trial data.
Uncoordinated national efforts.
Funding and corruption issues – unavailability and inadequate vaccines
No effective animal ID, tracking system inadequate for surveillance of stray dogs
Rabies has NOT been an effective reportable disease
The Facts…

• Human rabies, is a disease of poverty affecting vulnerable populations and children.
• Ignorance coupled with superstitions in extreme poverty creates a perfect storm for rabies.
• Elimination of human rabies is dependent on rabies elimination in dogs.
• Breaking the urban cycle involving maintenance of infection in dog populations and a sylvatic cycle involving wildlife.
Rabies control

- Awareness & Education (AE) and Interdisciplinary approach are critical [Compend Anim Rabies Control (2016)].

- Human Rabies Control must also include PEP, AE and elimination of rabid animal exposures.
HBB/GHS Initiative for Rabies control in Bangladesh

• With our mission, we, GHS and HBB partnered together, came forward to complement as a strategic partner to help eliminate the pernicious cycle of rabies in Bangladesh.

• HBB initiative: Pilot, community-empowerment tool – awareness building campaign

• GHS partnership: includes identifying and developing market-driven solutions to promote health and wellness in connection with rabies in Bangladesh
HBB Initiative for Rabies control in Bangladesh

Immediate objective: *Break the barriers of IGNORANCE & Save Lives!*

Awareness Building and Education:
Part 1: 2015-’16

- Day Camp at central Infectious Disease Hospital (IDH) rabies prevention unit
- Distribute calendars, posters, brochures to visitors/bite victims, health workers.
- Advocacy meeting with hospital staffs, doctors, nurses, health workers.
Awareness Building (contd.)

Part 2: 2016

• **A Quantitative Pilot Study** - Knowledge, Attitude and Practice (KAP). Baseline data collection/educational diagnosis (for Capacity Building and Mobilization)

• High school students and teachers (n=1,500) – Awareness building among school students. Share and spread the knowledge/word with families, friends relatives and the community.
HBB Initiative for Rabies control in Bangladesh

Awareness Building (contd.)

Part 3: 2017

- Collaboration with govt. – MOU/formal collaboration
- Advocacy/partnering meeting at the routine monthly Local Govt. Coordination Meeting
- Meeting resolution by the Admin dept to delegate task to respective departments (including Dept of Information, Education, Health, Livestock) to work with NGO (HBB).
- Initiate pilot project to train slaughter house workers, butchers who may get exposed to rabid food animals.
Future plans of HBB in Bangladesh

- Conduction of one Integrated Pilot study in an Island as Kutubdia / Cox’s bazar / Hatia. (Advocacy meeting at all levels, animal and human vaccination, Dog birth control, training to medical and paramedical personnel on diagnosis, prevention and treatment of animal bite cases)
GHS/HBB Future plans in Bangladesh

• Establishment of a central Rabies Diagnostic and Research Lab, lab diagnosis and treatment at central and field level.
• Development of national data base and surveillance system for animal bite and rabies cases.
• Human Resource Development
• Technical support for Procurement and production of quality vaccine (IDTCV & RIG) by Government & Private sector.
• Coordination with stakeholders working on rabies control (WHO, MOH, LGRD, DLS, FAO, OIE and NGOs)
Future plans of HBB in Bangladesh (contd.)

• Development of internet Apps to help animal bite victims, establish a network of trained people for immediate advise and referral for PEP
• Establishment of a Call center and maintain database.
• Coordination with MOH, LGRD, DLS for proper implementation of rabies control activities.
GHS proposed Plan on Rabies in Bangladesh

• Effective post-exposure prophylaxis (PEP) rabies treatment using plant produced recombinant rabies antibodies and antigens
• PPP: Affordability and sustainability - Local production of rabies vaccines, RIG
Interdisciplinary approach/Collaborative approach for Rabies control in Bangladesh

Effective rabies prevention and control through coordination and collaboration:

PPP: Strategic Partnership

• Govt. (local/national/interdisciplinary)
• NGOs: through the power of leveraging, sharing and partnering.
• Private Industry (vaccine, RIG manufacturing)
• International Collaboration: OIE, WHO, FAO, GARC other collaborative organization.
• Political will and funding crucial.
<table>
<thead>
<tr>
<th>Subject to be Answer</th>
<th>Pre KAP Test</th>
<th>Post KAP Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NRS</td>
<td>Percentage</td>
</tr>
<tr>
<td>Cleaning with soap &amp; water</td>
<td>260</td>
<td>44.4</td>
</tr>
<tr>
<td>Using antiseptics'</td>
<td>73</td>
<td>12.4</td>
</tr>
<tr>
<td>Using, salt, molasses, red chilly,</td>
<td>39</td>
<td>6.6</td>
</tr>
<tr>
<td>Spicy yeolow.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccination with ARV</td>
<td>150</td>
<td>25.6</td>
</tr>
<tr>
<td>No response</td>
<td>108</td>
<td>18.0</td>
</tr>
<tr>
<td>Total</td>
<td>585</td>
<td></td>
</tr>
</tbody>
</table>
GHS and HBB websites

ghs.ucdavis.edu
www. HumanityBeyondBarriers.org
By 

Humanity Beyond Barriers and Global Health Share, USA 

Date: 9 January 2016, 

Venue: Infectious Disease Hospital 

Coordinated by: Infectious Disease Hospital, Mohakhali, Dhaka and Filaria and General Hospital, Savar, Dhaka.
Thank You