



EPI Surveillance Bulletin



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Validation of Neonatal Tetanus Elimination in Bangladesh: A Major Public Health Success in EPI

Bangladesh is a country with 146 million inhabitants and about 4 million births annually, had in the 1980s one of the highest neonatal tetanus (NT) mortality rates in the world. In 1985, survey finding revealed that, prior to introduction of TT vaccination; NT mortality rate was 41 per 1000 live births causing more than 100,000 neonatal deaths due to NT in a year. To save millions of lives, TT vaccination introduced in Bangladesh (EPI) in 1979 along with childhood vaccination. A woman needs a total of 5 TT doses for protecting herself and ensure the protection her newborn at birth from tetanus. To achieve the goal of neonatal tetanus elimination, Government of Bangladesh started WHO recommended TT 5 dose schedule in 1993 resulting sharp fall of NT incidence rates: The survey results showed that NT rates had fallen 6 per 1000 live births in 1994 to 2.3 per 1000 live births in 2000.

In order to achieve the elimination goal of **less than 1 NT case per 1000 live births**, the National EPI together with its partner organizations (UNICEF, WHO) initiated Tetanus Toxoid (TT) supplemental immunization activities (SIAs) in 1995 targeting all eligible women (15-49 years) in hard to reach and high risk areas. TT SIAs were also conducted in 1999, 2000, 2001, 2005 and 2006. In addition, efforts were made to the improve access to safe & clean deliveries through Emergency Obstetric Care (EOC), expanding Skill Birth Attendant Training and establishing Satellite Clinics at the peripheral health units and strengthened social mobilization. Hence the number of reported cases of neonatal tetanus dropped from 276 in 2001 to 162 in 2006 and 154 in 2007.

In May 2008, National EPI in collaboration with WHO and UNICEF, carried out an evaluation (Lot Quality Assurance- Cluster Survey) to determine whether Neonatal Tetanus had been eliminated in Bangladesh. Two surveys were performed in Sunamganj and Rangamati districts where children were considered to be at the highest risk from neonatal tetanus. Sunamganj was selected as the poorest performing high risk district based on selected key indicators for scoring the districts. Rangamati considered the worst performing among 3 hill districts was purposively selected. The eligibility period of live birth for the survey was in between 15 April 2007 and 14 April 2008. Total numbers of live births surveyed were 1003 in Sunamganj and 982 in Rangamati. 28 Neonatal Deaths recorded in each of the districts. The neonatal death rate estimated from the survey is 28.5 (15.8-41.1) in Rangamati and 27.9 (17.4-38.3) in Sunamganj, comparable to a national rate 37 (BDHS 2007). The survey also assessed TT vaccination coverage and delivery practices.

These surveys found that no deaths from Neonatal Tetanus occurred in Rangamati and Sunamganj districts between 15 April 2007 and 14 April 2008; **this suggests that neonatal tetanus has been eliminated in these two high risk districts. It is likely that the disease has also been eliminated in other districts in the country where infants are considered to be at a lower risk.** This conclusion is further supported by the findings that in each of the districts, over 80% of mothers had received a protective dose of TT, based on immunization card and history. TT immunization is essential to protect mothers and newborns as the vast majority of delivers at home (>80%). These surveys also found that most of the causes of deaths are birth asphyxia, low birth weight, pneumonia and sepsis.

Elimination of NT in Bangladesh is to be considered as a major public health success. Maintaining NT elimination status, Bangladesh requires continued strengthening of routine TT immunization and SIAs in high risk areas. But more importantly, deliveries with trained birth attendants and or in health facilities should be a priority. Surveillance for NT should be strengthened; all NT cases should be investigated and Case Response Immunization (CRI) should be conducted in areas where a case is found. This success has been achieved through the joint efforts and steadfast commitment of all field workers and managers of Health and Family Planning departments, Partners, NGOs and other health service providers which needs to be continued for sustaining the achievement.

Surveillance Summary									
Description	2001	2002	2003	2004	2005	2006	2007	2008 ¹	
Number of AFP cases	1287	1365	1128	1301	1458	1619	1844	997	
No. of compatible cases according to virologic classification system	36	0	0	2	0	2	0	0	
No. of cases with isolation of wild poliovirus	0	0	0	0	0	18	0	0	
No. of discarded polio cases (i.e., non-polio AFP)	1251	1365	1128	1299	1458	1599	1844	817	
No. of cases pending classification	0	0	0	0	0	0	0	180	
Expected annual number of non-polio AFP cases (1/100,000 children <15 yr)*	533	549	556	563	1094	1114	1135	1153	
AFP Surveillance Performance Indicators									
Indicators	Target	2001	2002	2003	2004	2005	2006	2007	2008 ¹
01 Annual Non-Polio AFP rate in children < 15 years old	≥ 2.0	2.34	2.49	2.03	2.31	2.66	2.87	3.25	2.63
02 Completeness of passive reporting from facilities	≥ 90%	65%	62%	67%	82%	91%	89%	90%	93%
03 Timeliness of passive reporting from facilities	≥ 80%	38%	36%	62%	75%	84%	83%	85%	88%
04 Suspected AFP cases investigated within 48 hours of notification	≥ 80%	96%	96%	98%	98%	99%	100%	99%	99%
05 Confirmed AFP cases with 2 stool specimens collected within 14 days after paralysis onset	≥ 80%	80%	89%	90%	90%	92%	93%	92%	93%
06 Stool specimens arriving at laboratory within 3 days after collection	≥ 80%	97%	98%	99%	99%	98%	99%	100%	100%
07 Stool specimens arriving at laboratory in "good" condition "good" = 1. Presence of unmelted ice or temperature <8°C 2. Adequate volume (≥ 8 grams or size of ½ thumb) 3. No evidence of leakage 4. No evidence of desiccation (drying)	≥ 90%	100%	99%	100%	100%	100%	100%	100%	100%
08 Confirmed AFP cases receiving a follow-up exam at least 60 days after paralysis onset	≥ 80%	93%	99%	100%	98%	99%	100%	100%	98% ²
09 Stool specimens with laboratory results: - Within 28 days after specimen receipt (old algorithm)	≥ 80%	99%	100%	100%	100%	100%	98%	100%	-
- Within 14 days after specimen receipt (new algorithm)	≥ 80%								80% ³ 94% ³
10 Stool specimens from which non-polio enterovirus (NPEV) was isolated	≥ 10%	29%	28%	23%	20%	20%	15%	15%	24%

¹ Data as of July 12, 2008; ² among cases occurring up to April 27, 2008; ³ as of June 28, 2008. * Prior to 2005 NPAFP rate calculated as 1/100,000 under 15 children

Please provide your feedback and comments to Dr. Md. Abdul Jalil Mondal, DPM-EPI or Dr. Md. Tazul Islam, Program Manager,

Child Health & Limited Curative Care, EPI Bhaban, Mohakhali, Dhaka 1212 Telephone: 9880530 or 9898797

Chief Advisor to the Editorial Board: Dr. Saleh Md. Rafiq, Director PHC & Line Director ESD, DGHS, Mohakhali Dhaka.

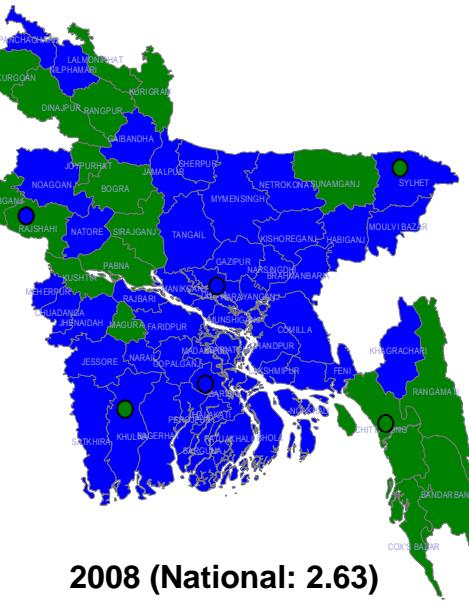
District	Minimum operational target of non-polio AFP		Total # AFP ¹		Wild polio-virus isolated		# Compatible cases	Non-Polio AFP cases ¹		Pending final classif. ¹		Annualized Non-polio AFP Rate ¹		Notification within 10 d after paralysis onset ¹		Investigation within 48 h after notification ¹		% with 2 stools within 14 days ¹		Stool sample arriving to lab within 72 hrs ¹		% with 60-day follow-up ²			
	2007	2008	2007	2008	2007	2008		2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Barisal Division																									
Barguna	7	7	23	8				23	7	0	1	6.25	3.50	100%	100%	100%	87%	100%	100%	100%	100%	100%	100%	100%	100%
Barisal (non BCC)	18	18	48	28				48	23	0	5	5.30	4.70	92%	93%	100%	100%	90%	93%	100%	100%	100%	100%	100%	100%
BCC only	2	2	4	4				4	2	0	2	3.87	3.53	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Bhola	15	16	39	34				39	29	0	5	5.05	6.91	95%	97%	100%	100%	97%	100%	97%	100%	100%	100%	100%	100%
Jhalakati	6	6	12	6				12	6	0		4.10	3.79	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Patuakhali	13	13	35	13				35	10	0	3	5.30	2.77	97%	92%	100%	100%	97%	85%	97%	100%	100%	100%	100%	100%
Perojpur	10	10	18	12				18	9	0	3	3.79	3.48	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA
Total_BAR	71	72	179	105	0	0	0	0	179	86	0	19	5.01	4.42	96%	96%	100%	100%	94%	96%	99%	100%	100%	100%	
CTG Division																									
Bandarban	3	3	4	2				4	1	0	1	2.78	1.26	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Brahmanbaria	21	21	40	17				40	15	0	2	3.81	2.62	90%	94%	98%	100%	90%	100%	100%	100%	100%	100%	100%	100%
Chandpur	22	22	34	16				34	13	0	3	3.14	2.16	94%	100%	100%	100%	94%	88%	100%	100%	100%	100%	100%	100%
Chittagong (non CCC)	39	39	53	23				53	17	0	6	2.74	1.61	92%	91%	100%	100%	91%	100%	100%	100%	100%	100%	100%	100%
CCC only	22	22	20	13				20	10	0	3	1.85	1.67	100%	92%	95%	100%	95%	92%	100%	100%	100%	100%	100%	100%
Comilla	41	42	81	30				81	29	0	1	3.94	2.58	98%	100%	100%	100%	94%	97%	100%	97%	100%	83%	100%	100%
Cox's Bazar	17	17	27	9				27	7	0	2	3.25	1.53	93%	89%	100%	100%	93%	89%	100%	100%	100%	100%	100%	100%
Feni	11	11	24	11				24	9	0	2	4.44	3.05	96%	100%	100%	100%	96%	91%	100%	100%	100%	100%	100%	100%
Khagrachari	6	6	12	6				12	5	0	1	4.38	3.18	92%	100%	100%	100%	100%	100%	92%	100%	100%	NA	100%	100%
Lakshmpur	13	13	34	11				34	9	0	2	5.13	2.49	97%	82%	100%	100%	73%	100%	100%	100%	100%	100%	100%	100%
Noakhali	23	24	27	16				27	14	0	2	2.32	2.20	96%	100%	96%	100%	89%	94%	100%	100%	100%	100%	100%	100%
Rangamati	5	5	7	3				7	2	0	1	2.73	1.41	100%	67%	86%	100%	67%	100%	100%	50%	NA	100%	100%	100%
Total-CTG	223	225	363	157	0	0	0	0	363	121	0	26	3.27	2.15	95%	95%	99%	100%	94%	92%	100%	99%	99%	94%	
Dhaka Division																									
Dhaka (non DCC)	27	28	47	29				47	23	0	6	3.47	3.00	91%	90%	100%	100%	91%	88%	100%	100%	100%	100%	100%	100%
DCC only	67	71	77	44				77	38	0	6	2.29	2.00	91%	91%	100%	100%	94%	95%	100%	100%	100%	100%	100%	100%
Faridpur	16	16	44	19				44	15	0	4	5.58	3.48	95%	100%	95%	93%	100%	100%	100%	100%	100%	100%	100%	NA
Gazipur	18	19	23	15				23	14	0	1	2.52	2.81	96%	100%	100%	100%	96%	100%	100%	100%	100%	100%	100%	100%
Gopalganj	10	10	19	20				19	14	0	6	3.79	5.14	100%	75%	100%	100%	89%	75%	100%	100%	100%	100%	100%	100%
Jamalpur	19	19	49	30				49	28	0	2	5.17	5.41	96%	97%	98%	87%	94%	100%	100%	100%	100%	100%	100%	100%
Kishoreganj	23	23	34	22				34	19	0	3	3.02	3.10	85%	95%	100%	100%	88%	95%	100%	95%	100%	100%	100%	100%
Madaripur	10	10	22	14				22	14	0	2	2.71	2.87	88%	100%	100%	100%	92%	94%	100%	100%	100%	100%	100%	100%
Manikganj	11	12	17	9				17	8	0	1	2.97	2.57	100%	100%	100%	100%	94%	100%	100%	100%	100%	100%	100%	100%
Munshiganj	11	11	26	19				26	14	0	5	4.65	4.61	92%	100%	100%	100%	96%	100%	100%	100%	100%	100%	100%	100%
Mymensingh	40	40	49	30				49	26	0	4	2.47	2.40	90%	87%	100%	100%	90%	93%	100%	100%	100%	100%	100%	100%
Narayanganj	20	20	30	13				30	13	0		2.99	2.36	87%	100%	100%	100%	90%	100%	100%	100%	100%	100%	100%	100%
Narsingdhi	18	18	24	16				24	14	0	2	2.71	2.87	88%	100%	100%	100%	92%	94%	100%	100%	100%	100%	100%	100%
Netrokona	18	18	42	16				42	14	0	2	4.75	2.90	93%	94%	100%	100%	86%	100%	100%	100%	100%	100%	100%	100%
Rajbari	9	9	13	6				13	6	0		3.05	2.58	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA
Sariatpur	10	10	21	12				21	11	0	1	4.34	4.17	100%	92%	100%	100%	95%	92%	100%	100%	100%	100%	100%	100%
Sherpur	11	11	21	13				21	8	0	5	3.75	2.63	81%	100%	100%	100%	90%	100%	100%	100%	100%	100%	100%	100%
Tangail	28	29	42	23				42	21	0	2	2.96	2.72	86%	78%	100%	100%	93%	91%	100%	100%	100%	100%	100%	100%
Total-DHAKA	366	374	600	350	0	0	0	0	600	300	0	50	3.29	2.98	92%	93%	100%	98%	92%	95%	100%	100%	100%	100%	
Khulna Division																									
Bagerhat	13	13	19	17				19	10	0	7	2.92	2.84	100%	100%	94%	95%	100%	100%	100%	100%	100%	100%	100%	100%
Chuadanga	10	10	14	14				14	13	0	1	2.95	4.97	93%	100%	100%	100%	93%	86%	100%	100%	100%	100%	100%	100%
Jessore	22	23	38	20				38	13	0	3	3.38	2.12	95%	80%	97%	100%	95%	75%	100%	100%	100%	100%	100%	100%
Jhenaidah	14	14	23	11				23	8	0	3	3.25	2.07	100%	100%	100%	100%	87%	82%	100%	100%	100%	100%	100%	100%
Khulna (non KCC)	13	13	25	12				25	9	0	3	3.90	2.59	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
KCC only	8	8	10	5				10	4	0	1	2.42	1.77	100%	80%	100%	100%	90%	100%</						

Disease Surveillance, 2007 - 2008

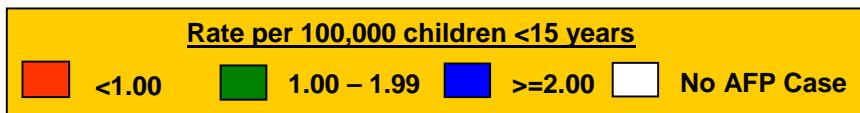
District	Neonatal Tetanus							Measles							AEFI				
	# of case reported by Active Surveillance		# of case reported by Passive Surveillance		# of case Investigated		# of case reported by Active Surveillance		# of case reported by Passive Surveillance		Outbreak*			# of case Reported					
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	Number of Outbreak (% Investigated)	# of cases							
Barisal Division																			
Barguna	4		2	1			4	1	18	13					11	8			
Barisal (non BCC)	1		1	1	3	1	4	2	8	7					27	25			
BCC only	1				1		3								0	0			
Bhola	4	2	6	3	5	2			13	3					16	8			
Jhalakhati	1	2		1	1	2	3			5					10	3			
Patuakhali	1		3				14	1	21	5					6	2			
Pirojpur			1	1			1			1					24	5			
Total BAR	12	4	13	7	10	5	29	4	65	29					0	0	94	51	
CTG Division																			
Bandarban									6							4	2		
Brahmanbaria	9	2	12		10	2				15						6	16		
Chandpur			1				1	3	52	23					21	24			
Chittagong (non CCC)	2		5				1	3	6	9					3	9			
CCC only	2		2		2		3	3	6						2	5			
Comilla	1		2		1			1	31	5					5	7			
Cox's Bazar	2		1		2		1		3						9	4			
Feni	6		8		6				27	4					7	12			
Khagrachari	1		1		1				2	1					7	1			
Laxmipur	3	2	2	1	4	2			32	39					15	10			
Noakhali	9		6		10		3	2	2	2					6	8			
Rangamati								1		7						1			
Total-CTG	35	4	40	1	36	4	10	12	174	98					0	0	86	98	
Dhaka Division																			
Dhaka (non DCC)			4						1	81	47					38	31		
DCC only	2	2	5	4		4	18	18	444	438	2(100%)				521	71	80		
Faridpur	1		3		1				33	22					50	52			
Gazipur	2	3	4	1	1	3	4	1	5	3	1(100%)				177	11	8		
Gopalganj	1		3						19	15					10	20			
Jamalpur	2	1	7	2	2	1			44	29					31	22			
Kishoreganj	15	3	15	2	5	1	11	5	13	20					21	27			
Madaripur	1	1	1	2	1		1		38	11					53	38			
Manikganj			3					2	124	74					43	30			
Munshiganj		1	3			1	3	2	158	154					40	40			
Mymensingh	10	4	13	2	12	3	7		14	32					24	29			
Narayanganj	1		2		1			1	47	46	1(100%)				80	23	17		
Narsingdi		1	1			1	1	2	2	1					20	8			
Netrokona	3		5		5	1	3		57	19					29	17			
Rajbari									21	16					9	48			
Shariatpur	1		1					2	20	18					41	34			
Sherpur	1		2						20	15					11	16			
Tangail	3		1		3		18	7	21	9					16	29			
Total-DHAKA	43	16	73	13	31	15	68	39	1,161	969	4(100%)				778	0	541	546	
Khulna Division																			
Bagerhat	3	1	5	2	2	1	1	1	17	36					43	23			
Chuadanga			1				2	1	40	27					22	14			
Jessore	4		6		4		2	9	5	40					21	10			
Jhenaidah	1		1		1		2		7	6					18	13			
Khulna (non KCC)	2				1			1	46	6					38	20			
KCC only	1		2					1	1	4					7	8			
Kushtia	5	2	4	1	5	2	4		82	36					26	11			
Magura								3	21	41					9	12			
Meherpur			1						20	10					9	2			
Narail	4		2		5		1	1	9	2					5	6			
Satkhira	2		2	1	2	1	1		18	5					28	17			
Total-KHU	22	3	24	4	20	4	16	17	266	213					0	0	226	136	
Raj Division																			
Bogra	4	2	2	3	5	2	9	2	12	14					89	61			
Dinajpur	4	2	7	2	4	2		1	10	12					29	32			
Gaibandha	1		4	1	3	4									10	20			
Joypurhat									7	11					15	12			
Kurigram	1				1					2					3	9			
Lalmonirhat	1	1							4						16	12			
Natore	3		4		3		5	3	25	44					18	35			
Nilphamari		1		1			1								18	9			
Noagoan	3	1	2	2	3	1	4	4	29	65					22	29			
Nowabganj	1		1		1		2	1	10	26					19	12			
Pabna	1	2	3	2	1				9	23					19	19			
Panchagarh	1		2		1				6	2					18	9			
Rajshahi (non RCC)	2	1	1	2	2	1	7	6	20	8					29	25			
RCC only								2	161	54	1 (100%)				49	27	32		
Rangpur	2							1		1					7	19			
Sirajganj	1				1		2		12	3					7	11			
Thakurgaon	2	1	5		2		1	2	3	2					38	20			
Total-RAJ	27	11	31	13	27	11	30	22	308	267	1 (100%)				49	0	384	366	
Sylhet Division																			
Habiganj	7	2	6	3	7	3			14	7					23	15			
Maulvibazar	6	2	5	3	6	3	1		22	13					12	2			
Sunamganj	11	3	11	1	14	4	31	23	46	34					13	17			
Sylhet (non SCC)	3	5	3	5	3	5	2	5	35	22					8	3			
SCC only			1					8	18	6	5				1	2			
Total-SYL	27	13	25	12	30	15	42	46	123	81					0	0	57	39	
National	166	51	206	50	154	54	195	140	2,097	1,657	5 (100%)				0	827	0	1,388	1,236

Data as of 15 July 2008, * Only Lab Confirmed Measles and Mixed Type outbreak Cases

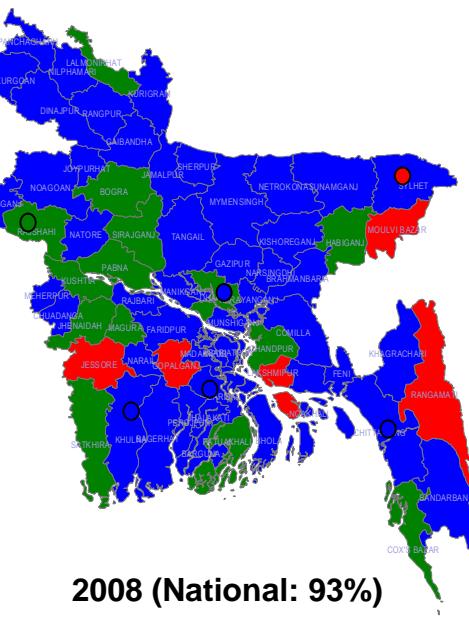
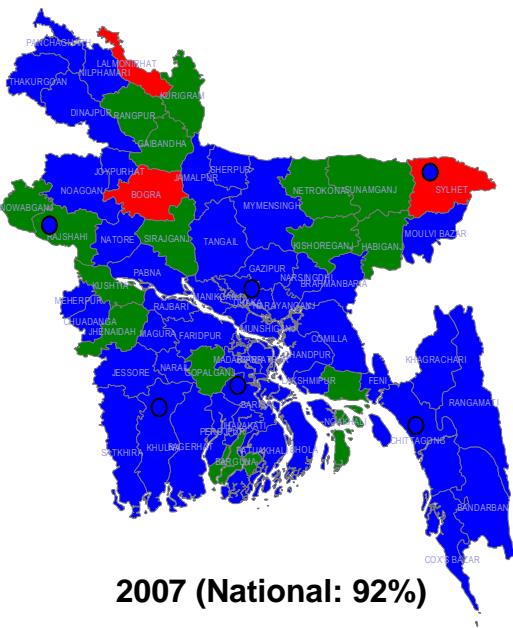
Annualized Non-Polio AFP Rate, by District, Bangladesh 2007-2008*



*Data as of 12 July, 2008



Percentage of AFP Cases with Two Stool Samples Collected within 14 days of Paralysis Onset, by District, Bangladesh 2007-2008*



*Data as of 12 July, 2008

International Developmental Partners for Polio Eradication in Bangladesh include Centers for Disease Control and Prevention, Atlanta, Governments of Japan, the Netherlands, USAID, Rotary International, U.K. DFID, UN Foundation, UNICEF and WHO