

## Original Article

# Immunization: Concept, Maternal Knowledge, Attitude and Practice

Md. Abdur Rahman<sup>1</sup>, Sybilla Ferdousy<sup>2</sup>, Md. Raquib Rahman<sup>3</sup>, Nadia Sharleen<sup>4</sup>

### Abstract

**Objective:** Immunization programme laid down by WHO has revolutionized the health status of human population. Bangladesh is no exception in it. The study will be able to provide and compare the concept and practice of immunization among Gazipur district and other places both at home and other developing countries

**Method:** This cross-sectional observational study was conducted in the district of Gazipur to evaluate maternal knowledge, attitude and practice of immunization. Simplified cluster sampling method was used. A total number of 212 mothers were selected for individual focus group discussions mostly from similar socio-economical background, permanent residents of the community and having at least one child of age between 13 to 23 months. The data was collected using a questionnaire at focal group discussions. The results of cluster sampling surveys were compared with computer simulated surveys. It was found that the result was satisfactory with 95% confidence limits within plus and minus 10%.

**Result:** About 87% of mothers were able to name two or more EPI diseases and 13% were unable to name at least two EPI diseases. About 81% of the children were fully immunized and 19% were incompletely immunized. 77% of them had immunization cards, 4% had no card and 19% had lost their cards. The dropout rate from the immunization was higher among those who had lost their cards than those who had retained them.

**Conclusion:** This comparison may focus on the strength and weakness at Gazipur district and may be able to give us the directions to improve upon the situation of immunization at Gazipur as such whole Bangladesh.

**Key words:** Immunization, EPI, Fully immunized (FI), Immunization card (IC)

### Introduction

Immunization is the most effective way of reducing childhood morbidity and mortality from the six target disease of the world health organization's expanded programme on immunization (EPI): diphtheria, poliomyelitis, tuberculosis, whooping cough and tetanus.

During the last decade a public health revolution has taken place throughout the world. Immunization services which were virtually non-existent in developing countries in 1974 (only 10% coverage) now administer doses against preventable diseases to more than 70% of the world's children. Thus EPI now claims to prevent 1.9 million childhood deaths.<sup>1</sup>

The world health assembly in May 1974 decided that all children of the developing countries will be immunized by the year 1990.

Immunization levels must be raised to at least 80% for all children of the world by 1990 and at least 90% in the context of comprehensive maternal and child health services by the year 2000. Enormous work has already been done in the developing world in collaborations with international organization in the past 15 years to reach the goals<sup>2</sup>. This has been achieved by immunization programmers which now reach approximately 80% of all children.

The main task is now to sustain this achievement and to extend it to the remaining 20%. Generally the poorer are harder to reach among whom disease has been more found and commonly fatal<sup>3</sup>.

In the past, it has been observed that in Bangladesh a large number of children die every year due to EPI target diseases before the age of one year. As a result, the need

1. Professor, Department of Paediatrics, BRB Hospital, Dhaka
2. Associate Professor. Department of Physiology, Ad-Din Women's Medical College, Moghbazar, Dhaka
3. Junior Consultant, Ispahani Islamia Eye Institute & Hospital
4. FCPS Part II course student, BSMMU

**Correspondence:** Dr. Md. Abdur Rahman, e-mail: abdurrahman7654@gmail.com

for alternative protection for the child was realized. Consequently immunization was introduced into Bangladesh. EPI was first started in Bangladesh on 7<sup>th</sup> April 1979. Immunization coverage at this time as a whole was very marginal (only 2% completely immunized). A new plan of action was taken in July 1985 to reach the WHO EPI target by June 1990<sup>4</sup>. Target population (1986-90): Children under one year of age were the principal target but children up to two year ages of age were the also provided with immunization services. The target population for TT was women of child bearing age with special emphasis on pregnant woman. The key elements of the plan included intensive mobilization techniques to generate support and demand, involvement of health complexes in immunization services, extending rural outreach services in a progressive manner and intensifying immunization activities.

The Gazipur district is well covered under the extended programme on immunization (EPI), there is almost always a smooth supply of immunization materials. District headquarters are the main source of vaccine supply in the upazilla, union and wards where outreach centers are operated.

This is the first referral centre for the primary health care network.

### **Immunization status in different countries**

Studies conducted in Mozambique, Burma, Nepal, India, Iran and other countries of the world showed that certain factors were associated with the vaccine uptake in a community. These factors differ from country to country. Even in the same country there may be differences within different communities. Considering all these factors into account, a questionnaire was prepared to conduct a survey in Bangladesh using the cluster sampling method. This technique allows a small number of target populations to be sampled while providing data which are statistically valid. However, in spite of the popularity of the simplified cluster sampling method, its routine use by the national and international organizations and the wealth of information thus gained, reports on the reasons for partial immunization in developing countries are seldom published and so are limited and the presence of obstacle. Occasionally, the results of such surveys are published in greater detail.

A recent survey in Mozambique showed that vaccine coverage based on documented in record was 53% in urban and 60% in rural areas. Factors related to individual mother and child and factors related to the

clusters were investigated for their association with vaccine uptake. Those who showed a strong negative offering days per week, cancellation of outreach sessions, knowing a child with post vaccination abscess, child born in home, large family and a mother's inability to speak the local language (Portuguese)<sup>5</sup>.

On the other hand, another study in Nepal showed that only 4% (10/228) of the Nepalese children and full coverage with recommended doses of vaccine against target diseased. It also showed that male children were twice as likely to have received vaccines as females (76/122, 62%VS48/106, 45%. Odds ratio = 2.00). Children born at a hospital were more likely than those born at home to have been vaccinated (23/24, 68% VS 101/194, 52% p=0.05). Most mothers obtained health information from neighbors (38%), radio (22%) and health workers (18%). More than 70% of the women felt that vaccinations were good preventive measures.

On 1986, a survey was conducted in Iran, the result of that survey differed from that of Nepal survey. In this survey it was found that 55% of Iranian children had complete immunization. Apart from mother's knowledge and motivations, residence in the rural areas and utilization of antenatal care showed a positive association with vaccine uptake. On the immunization of the children. The association between maternal tetanus immunization and child's immunization was negative<sup>6</sup>.

In 1987, it was observed that children in a rural region of Burma were not receiving their vaccine until much later in life. Coverage for DPT declined from 78% for the first dose to 41% for the third dose. BCG immunization coverage was nearly the same for the first dose of DPT<sup>7</sup>.

Cluster sampling survey showed that the percentage of non-immunized children in Delhi, India was significantly higher in rural (8.0%) as compared to urban areas (2.3%)<sup>8</sup>.

Another study in U.P., in India discovered that except for measles, a significantly higher vaccination coverage was observed for male children as compared to female children for every vaccine, this being 65.2% and 60.9%, respectively for DPT 3<sup>rd</sup> dose and OPV 3<sup>rd</sup> dose for boys as compared to 51.9% and 49.5% for girls.

In India, another survey showed that the main factors associated with low vaccine uptake were, unawareness of immunization (20.44%), inconvenient immunization time (9-29%), sick child (16) and lack of knowledge about dose schedule (9%)<sup>9</sup>.

In the Republic of Cameroon it has been observed that cont, waiting time, distance of the health complex and

language barriers were the most important factors associated with vaccine uptake in the community.<sup>10</sup>

One Ghanaian study correlated the relationship between immunization status and serial distance: if they lived at the site, 89.2% were vaccinated, away from the site but less than three miles away, 69.8% were vaccinated: none who lived three or more miles away, were vaccinated.<sup>11</sup>

In Burma, another study showed that immunization coverage of a country varies from state to state due to geographical situation. In 1983, proportion of fully immunized children varied from one state to another and ranged from 40-60%.<sup>12</sup>

### Materials and Methods

The Gazipur district was sub-divided into Upazillas, unions and wards on a map. Wards were numbered for the whole district and using a random number table 30 wards were selected randomly for the cluster sample. Each cluster contained seven children in between 12 to 23 month of age. This date would reflect the coverage period of about one year period to this survey. Total sample size was 212. The study was mainly based on qualitative methods such as focus group discussion, The strength of qualitative methods includes allowing the respondents to express in their own words, the reasons for their own beliefs and behaviors. Mothers were selected for individual focus group discussions mostly from similar socio-economical background, permanent residents of the community and possession of at least one child of age between 13 to 23 months. To estimate the 'Immunization coverage' a simplified cluster sampling method was used which involves random selection of 210 children in 30 clusters of seven children in each group. This is based on a survey technique originally used in the United States of America. WHO experts found that this technique can quickly and effectively monitor and evaluate the immunization programmes at the community levels. The data was collected using a questionnaire (Appendix 1) at focal group discussions. The results of cluster sampling surveys were compared with computer simulated surveys.

### Results

The average age of the mother was 25.61 years – 62% were under 25 years of age and 38% were above 26 years of age. Of them 74% were illiterate and 26% were literate.

Most of the mothers (87%) were able to name two or more EPI diseases and 13% were unable to name at least two EPI diseases (Table-III). 76% of the mothers were living within three miles of the health complex and 24% were living at distance more than three miles away from

the health complex. In the study children 51% were male and 49% were female. Eighty one percent of the children were fully immunized and 19% incompletely immunized. Of them 77% had immunization cards, 4% had no card and 19% had lost their cards. 98% had home delivery.

**Table I:** Characteristics of the mothers

Age of Mothers:	No	%
25 Years or less	132	62
26 Years or over	80	38
Occupation of mothers		
Housewife	209	98
Others	3	2
Income per month		
Less than 2000 taka	190	89
Over 3000 taka	9	5
Place of delivery		
Home	202	98
Hospital	10	2
Member of social organization		
Member	52	25
Nonmember	159	75
Number of children		
3 or less	164	77
4 or more	48	23
Distance of Health complex		
3 miles or less	161	76
Over 3 miles	51	24
Belief in vaccination		
Confident	83	39
Doubtful	129	61
Drinking water supply		
Safe Water	212	100
Possession of latrine		
Yes	129	61
No	83	39

**Table II:** Educational status of the mothers

	Mother's Education	Number	Percent
1.	No schooling can't read & write	130	61.3
2.	No schooling but can read & write	27	12.7
3.	Primary education (5 years)	49	23.1
4.	Secondary education (10 years)	6	2.8
Total		212	100

1+2= Illiterate (74%) 3+4= Literate (26%)

Table III shows that 87.3% of the mothers were able to name at least two EPI diseases and 12.7% were able to name one EPI disease or none at all. It has been observed that 80.7% children were fully immunized and 19.3% children were incompletely immunized (Table III). Regarding immunization against tetanus, 67.5% were fully immunized, 17.5% were partly immunized and 15% were not immunized at all (Table IV). 74% of the mothers were illiterate and 26% of the mothers were literate (Table V).

**Table-III:** Maternal knowledge about EPI diseases

Number of diseases mother can name	Number	%
4 to 6	53	25.0
2 to 3	132	62.3
1 only	7	3.3
Nil	20	9.4

**Table IV:** Characteristics of the study children

Ages of children between 12 to 23 months.		
Sex of the children	N	%
Male	107	51
Female	105	49
Immunization		
Complete	171	81
Incomplete	41	19
Possession of card		
Yes	164	77
No	9	4
Lost	39	19

**Table V:** Immunization status of the children

Immunization status	Number	%
Fully immunized	171	80.7
Incompletely immunized	41	19.3
Total	212	100

Children of those who were able to name two or more target diseases were more likely to be vaccinated than those who could not name the target diseases ( $p < 0.05$ ) (Table XI).

**Table VI:** Immunization status of the mothers against tetanus.

Immunization status	Number	%
Fully immunized	143	67.5
Partly immunized	37	17.5
Not immunized	32	15.0
Total	212	100

**Table VII:** Maternal education and immunization status of their children

Mother's Education	Immunized	%	Incompletely Immunized	%
1. No schooling	126	73	31	76
2. With schooling	45	27	10	24

P=ns odds ratio=1.11

**Table VIII:** Maternal education and immunization against tetanus P = NS

Maternal education	Fully Immunized N=143 %	Partly Immunized N=37 %	Not Immunized N=32 %
1. No schooling	101 (71%)	29 (78%)	27 (84%)
2. With schooling	42 (29%)	8 (22%)	5 (16%)

**Table IX:** Age of the mother and immunization status of their children

Maternal age	Fully immunized child (N=171)		Non-immunized child (N=41)	
25 years or less	92	54%	20	48%
26 years or more	79	46%	21	51%

P=ns

odds ratio = 1.22.

**Table X:** Maternal age and immunization against tetanus.

Maternal age	Fully Immunized	Partly Immunized	Not Immunized
25 years or less	94 (45%)	15 (41%)	3 (9%)
26 years or more	49 (34%)	22 (59%)	29 (91%)

$p < 0.05$ .

**Table XI** Maternal knowledge about EPI diseases and immunization status of their children

Number of diseases can name	Fully immunized		Not immunized	
	N	%	N	%
2 or more	157	91	27	66
1 or nil	14	9	14	44

$p < 0.05$ .

## Discussion

The dropout rate from the immunization was higher among those who had lost their cards than those who had retained them. Mothers knowing the name of EPI diseases were more likely to be vaccinated than those who did not know the name of the diseases. Regarding immunization against tetanus more than 50% mothers above 25 years were fully immunized.

It is well established that education of mothers changes their attitude towards immunization. In this study it has been observed that 80.7% children were fully immunized and 19.3% children were incompletely immunized (Table III). Regarding immunization against tetanus, 67.5% were fully immunized, 17.5% were partly immunized and 15% were not immunized at all (Table IV). 74% of the mothers were illiterate and 26% of the mothers were literate (Table V).

About 73% of the children of illiterate mothers were fully immunized and 76% were incompletely immunized (Table VI). Of the children from literate mothers 27% were fully immunized and 24% were incompletely immunized. This showed that there was no significant relation between education of the mothers and vaccination of their children. Similar result was also found with regards to maternal education and immunization against tetanus (Table VII).

These results correlate with the finding of the study carried out in Nepal. The educational status of the Nepalese mothers was not found to be a significant predictor of child's vaccine coverage. On the other hand, the father's education was strongly associated with the likelihood of being vaccinated (Table-VIII).

Like most of the developing countries, in Bangladesh the father is the main decision maker in the family. So parental education both father and mother is more important than maternal education alone.

There was no significant difference of knowledge between mothers regarding immunization for their children. On the other hand, a significant difference was found in these two groups of mothers regarding maternal immunization against tetanus (Table 9).

This may be explained by the fact that younger mothers are more likely to be educated and therefore able to make decisions

regarding their own health. However when it comes to their children, the grandparents are still the decision makers. The role of the grandparent in the family and the extent of their influence, need to be investigated further.

These findings simulate the study findings of Mozambique. Mother's inability to name at least two EPI target diseases had strong negative association with vaccine uptake in Mozambique.

## Conclusion

This small scale study on immunization-Global prospective and Gazipur prospective will be able to develop an idea about a short history of evolution of immunization, its global status, situation in Bangladesh and a small population study covering Gazipur district which describes maternal concept, their attitude and practice. This study will also help planning of expansion of immunization in the national and international level.

## References

1. World Health Organization, Expanded Programme on Immunization. Progress and evaluation report. 1989; 1-2.
2. AKF/UNICEF/WHO. Towards more effective use of primary health care technologies at the family and community levels. 1985; 1-2.
3. World Health Organization, Expanded Programme on Immunization. Information system report. 1990 July.
4. Director General of Health Services. Bangladesh Health Services Report. 1985.
5. Cutts F T, Rodrigues L C, Colombo S, Bennett S. Evaluation of factors influencing vaccine uptake in Mozambique. *Int J Epidemiol* 1989; 18 (2): 427-33.
6. Nasseri K, Latifi M, Azordegan F, Shafii F, Ali-E-Agha R. Determinants of partial participation in immunization programme in Iran. *Socsci Med* 1990; 30 (3): 379-83.
7. Fredrichs RR, Tar Tar K. Use of Rapid Survey Methodology to Determine Immunization Coverage in Rural Burma. *J Trop Pediatr* 1988; 34 (3): 125-29.

8. Mehra M, Dewan S, Aggarwal S. Immunization coverage evaluation surveys in rural Narela zone and city zone areas of Delhi. *Indian Ped* 1990; 27 (4): 342-46.
9. Basu R N. India's Immunization programme. *World Health Forum* 1985; 6 (1): 35-38.
10. Brown J, Djogdom P, Murphy K et al. Identifying the reasons for low immunization coverage. A case study of Yaounde (Cameroon). *Rev Epid San Pub* 1982; 30: 35-47.
11. Belcher D N, Nicholas D D, Ofosu-Amaah S, Wurapa F K. A mass immunization campaign in rural Ghana: factors affecting participation. *Pub Health Rep* 1978; 93: 170-76.
12. World Health Organisation, Expanded Programme on immunization. *WklyEpid Rec* 1984; 59 (36): 273-80.
13. World Health Organization, Expanded Programme on Immunization. Training for mid-level managers, Coverage survey 1988.