

Historical Persepctive of Immunization in Bangladesh

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201

A Historical Perspective

This chapter makes an attempt to connect the long history of health initiatives of the past, to the recent. It considered immunisation campaigns and routine activities under the Expanded Programme on Immunisation (EPI).

Immunization is ancient to Bangladesh. Greenough (1980) examined the transition from variolation to variolation-vaccination to intensified-vaccination. Variolation was widely spread, carried out by a category of professional inoculators (*tikadars*), who by experience learned how to minimise risks of negative side-effects. From the correspondence of the Europeans evidently Bangali variolators especially smallpox inoculators were active from at least 1731. Arnold (1993) positions the disease in the colonial society of British India. J.Z. Holwell (1767), the British East India Company physician had made it clear that smallpox was a part of unchanging Indian landscape. McNeill noted, 'smallpox ... was of considerable significance in Hindu India from time immemorial – however long that may be historically. Unfortunately, absence of records permits no account whatever of Indian encounters with infectious disease before 1200' (McNeill: 1976:144).

The Dutch naval commander Stavorinus (1798) visited the Dutch naval factory at Chinsurah in Bengal in 1770. He wrote: '*inoculation is known among the Bengalis, who practice it by powdering some smallpox particles, which they make the patients swallow in some liquid. There are very few who use it for insertion.*' In short it seems inoculation was known and used in the middle of the eighteenth century in and around the region known as Bangladesh today. That vaccination has a long history can be proved by the fact that vaccinators were known as '*Tikadar*'.

Here, by adding the Persian prefix '*dar*' to a common noun it becomes a collective noun, meaning a professional group. This class of people may be doing this specialized job during the high Mughal period. Holwell reported about the activities of *tikadars* by saying that the inoculators worked in the style of a campaign who went 'one side of the street and the other'. They were employed from morning until night.

Inoculation is performed in Indostan by a particular tribe of Brahmins, ... they plan their traveling circuits in such a way as to arrive at the places of their respective destination some weeks before the usual return of the disease; they arrive in commonly Bengal provinces early in February. The inhabitants of Bengal, knowing the usual time when the inoculating Brahmins annually return, observes strictly the regimen ... The operator takes his fee which from the poor a 'pun' or 'cowries' equal to about one penny sterling and goes on to another door .. and is thus employed from morning till night, inoculating sometimes 8 to 10 in a house (Holwell, 1767: 23).

Tika a small word to fight great diseases

The '*tika*' a Bangla word meaning vaccination also means the pock scar. It is said '*tika*' comes from the word '*gutika*', meaning small bead. *Gutika* comes from the word *guti*, having the same meaning but it is the larger bead. According to the anthropologist Ralph Nicholas, the Bangla word *tika* is derived from the Sanskrit '*vatika*', which means a small lump or globule. This term was later used to refer the act of vaccination:

It was based on the idea that smallpox was produced from a seed (*bija*) mixed with the blood of a person, implying a theory of infection not contained in the Ayurvedic humoral explanation of the disease (Nicholas, 1981: 28).

Harish Naraindas brought out an interesting element about *tika*. According to him *tika* introduced by state interfered with the privacy of human body. In 1850, every vaccinated child was given a 'Note and Ticket', with a set of instructions, as if a recognition for the *tika*. The pock by then had

become a *new* sacrament as an externally visible symbol. It was a symbol not only of the internal state but of the *State* (Naraiandas, 1997: 11). It indicated that the vaccinated person had not only taken the disease and was protected but was also branded with external marks.

The variolation stage could be periodized from c. 1700 to 1800, followed by inoculation. Three Inoculation Hospitals were established in Bengal presidency in 1790 while the introduction of Jenner vaccine started in 1798 in England. It took four years for the Jenner vaccine to come to Bengal. Because both the systems ran side by side, the variolation-vaccination stage worked from 1802 to 1865.

During the 19th century in British India, the colonial state gradually imposed vaccination on the entire society, repressing variolation in the process. This was not a smooth or linear development; it was characterized by confrontation and resistance (Naraiandas et al., 1997). The evolution of state immunisation practices, that is, the imposition finally got its way through various commissions in the nineteenth and twentieth centuries. These were The Smallpox Commission, The Cholera Commission, The Plague Commission, and The Malaria Commission.

The scientific public health institutions started in India in the middle of the nineteenth century, almost 100 years after the establishment of British rule. In the spring of 1849, half a century after the advent of vaccination in Bengal, Calcutta was ravaged by an epidemic of smallpox. To find the root cause of the dreadful disease the British government set up a commission to inquire into its causes and spread, and suggest measures to ameliorate it. The commissioners submitted their reports in July 1850, under the guidance of Duncan Stewart, the Superintendent General of Vaccination. There was a widespread belief among the Bangali population that the vaccination no longer worked. The commissioners believed otherwise. They were convinced that inoculation was the devil. The only way to solve the problem was to stop inoculation by "public enactment and penalties" (Report 1850:57). It was a replication of the law passed in Britain in 1840, which outlawed the practice of inoculation.

The compulsory National Vaccination Act was passed in 1880. The practice of taking out of the vaccine pustules in order to obtain serum for more vaccinations is a very painful process. As late as 1893, Dyson the sanitary commissioner for Bengal says: *"It also sometimes happens that the infants thus used to die from tetanus, exhaustion, and combined fever. It is therefore not surprising that the present attitude of the people of Bengal is still more or less hostile towards vaccination, and that parents covertly hide away their children from the vaccinators"* (quoted in Arnold 1993: 142).

In 1945 there were two officers in charge of health, in the centre of All India Administration. One was responsible for curative aspect of medicine known as Director General Medical Services, and the other for the preventive aspect of medicine known as Public Health Commissioner. One of the jobs of Public Health Commissioner had been what the Director of Expanded Programme on Immunization does today. When Pakistan came into being in August 1947 it had to face immense difficulties in organizing the health service. Two of the main provinces of India, Bengal and Punjab had been partitioned, resulting in the dislocation of the services. This was terribly felt in East Bengal (now Bangladesh) because the centre and capital of Bengal were Calcutta, and to cut off Calcutta meant total dislocation of all services and service personnel. The lack of efficient manpower was one of the serious problems in East Bengal. The medical and technical staff were mostly composed of Hindus, and after the partition most of them left East Bengal, leaving the medical institutions ill equipped and ill staffed to meet health emergencies. The following statement of Moulana Akram Khan, the then leader of ruling East Pakistan Muslim League, aptly summarizes the situation:

East Bengal, neglected in every way during the period of her dependence, had been a hot-bed of malaria, kala-azar, tuberculosis, etc. With all their might, the Bengal Government has now commenced a fight against all those maladies....Dacca, which was notorious for filth, refuse, polluted water and mosquito pests has now gotten rid of mosquitoes. It is certainly delightful and glorious to say so.... Along with malaria an attempt will be made to make the anti-tuberculosis and anti-cholera schemes, successful. The TB vaccine on large scale will soon be given. Like the

smallpox vaccination, the B.C.G. inoculation also is an antidote against tuberculosis (The Pakistan Observer, September 1, 1949).

Out of 29 municipalities of the undivided Bengal, 9 came to the share of East Bengal, now Bangladesh. Out of these, only 4 municipalities undertook the work of medical inspection of school children. This was the beginning of the immunisation programme in the schools. The students were given cholera vaccines and later on BCG. In 1948 a few new schemes were prepared and put into operation. Significant amongst them were: (a) health examination of school children in the government aided secondary schools in the city of Dhaka catering for 500 boys, and (b) health examination scheme in the primary schools of Chittagong, Dhaka and Joydebpur.

In 1949 the government decided to enforce a scheme for provincialisation of rural health services and unification of health and medical services in a number of district and local boards. The government also decided to take over the administration of 100 thana dispensaries in these districts and to add a four-bedded emergency ward in each. In addition it was proposed to establish 50 new rural dispensaries in these districts.

Death and Immunisable Diseases in East Bengal

Smallpox: The number of deaths from smallpox rose from 926 in 1947 to 8,216 in 1950 and 30,640 in 1951 in the geo-political area of East Bengal. In 1950 the districts of Faridpur, Bakerganj and Tipperah recorded over 1,000 deaths each, and Dhaka district over 1,400 deaths. In 1951 the disease again broke out into an epidemic form, due to the incoming refugees from Calcutta, where the disease was still raging. Pabna recorded 5,281 deaths, the highest in the province, as against 174 in the previous year. The districts of Dhaka, Faridpur, Bakerganj and Bogra were also affected, the total number of deaths ranging among 2,305 to 3,554 in these districts.

In 1947 and 1948 when the Provincial Vaccine Institute was not functioning to its normal capacity owing to various difficulties, a large quantity of vaccine lymph was imported. In addition to mass

vaccinations that were given every year, other measures taken including enforcement of the Epidemic Diseases Act and health propaganda to acquaint the general public with methods of self-protection against the disease.

Tuberculosis: Tuberculosis of the lungs was regarded as the second serious problem in East Bengal, after malaria. Till November 1949 when the BCG vaccination campaign was started, nothing noteworthy was done to combat the disease. There were only two TB clinics in the whole Province, one at Barisal and the other at Rajshahi without any TB expert or necessary equipment and apparatus. Mymensingh district had the highest recorded number of deaths from TB each year, while the Chittagong Hill Tracts recorded the lowest. It is stated that the chief factors contributing to the upward trend in the incidence of this disease were malnutrition, poverty and lack of education among the people.

In 1950 the BCG vaccination campaign was continued in Dhaka City and extended to Bogra, Chittagong, Comilla and Mymensingh districts. The campaign was continued and BCG vaccination of children was carried out in most of the districts and sub-divisional towns. To publicize the usefulness of BCG vaccination, posters and pamphlets were liberally distributed among the local bodies. A scheme for the establishment of a TB Control and Training Centre in Dhaka with the assistance of WHO and UNICEF was prepared in 1951. However, with their assistance a TB Control and Training Centre was established in Karachi. Interestingly enough majority of population lived in East Bengal and the Centre was established in the West wing of the country. The BCG production laboratory was also established in Karachi only. A most significant part of the story in the post Pakistan period is the total eradication of smallpox. Through the efforts of the people and the government of Bangladesh, and with the assistance of international agencies like the World Health Organisation (WHO), the disease was completely eradicated from Bangladesh in 1978 through vaccination.

The Expanded Programme on Immunization

With the last case of smallpox detected and cured in Bhola on October 17, 1975, smallpox was deleted from the immunisation list. Following this achievement the vaccines against six deadly but

preventable diseases of diphtheria, tetanus, tuberculosis, poliomyelitis, whooping cough and measles were included in the preventive health agenda of Bangladesh. In line with the WHO initiated Global Strategy for Primary Health Care of 1978, which set the objectives of immunising 80% of world's children by 1990, and reducing child death from the preventable diseases, the GoB launched the Expanded Programme on Immunization (EPI). This launching took place on April 7, 1979, the World Health Day. The Project was initially housed in the old smallpox building at Mohakhali, Dhaka and staffed with personnel working for smallpox eradication.

Government Immunization Policy

The government announced its immunisation policy in December 1985. It consisted essentially of the strategies to be adopted for implementing the intensified programme. The Ministry of Health and Family Welfare (MOHFW) set the following specific objectives to achieve the global immunisation goals for Bangladesh:

- Elimination of poliomyelitis (that is, Zero cases) from the country by the year 1995 and eradication of polio by 2000.
- Elimination of neonatal tetanus by 1995.
- A 90% reduction in measles cases and a 95% reduction of measles deaths by 1995.
- Achievement and maintenance of at least 85% immunisation coverage of one-year old children and universal tetanus immunisation for women in the childbearing years.

The major elements of the immunisation policy were:

- Children should be protected from the diseases by providing immunisation at an early age through the following schedule:

After birth (at first opportunity)	: BCG, OPV
6 th week	: DPT, OPV
10 th week	: DPT, OPV
14 th week	: DPT, OPV
9 th month	: Measles

Children born at hospitals should be given BCG and OPV before they leave the hospital. Others should be given the vaccines with the help of the health workers at the earliest opportunity. All childbearing mothers should be given two doses of Tetanus Toxoid (TT).

- Each and every opportunity for immunising the children has to be utilized. It is important that the malnourished children are immunised. Immunization shall not be stopped in case of children having slight fever, dysentery or other minor diseases.
- DT vaccines shall not be used during regular vaccination programmes.

Some strategies were adopted following the principles set by the World Health Assembly. These are as follows:

1. EPI shall be developed in conformity with the Primary Health Care Programme;
2. deployment of enough person power in EPI;
3. sufficient financial allocations for EPI; and
4. monitoring of the expansion of the immunisation programme.

Major activities envisaged under the aforementioned strategy included:

- EPI shall be integrated with diarrhoeal disease control and birth control operations in the 3rd Five Year Plan (FYP). From now on, under the new system of operation, the field workers of both the family planning and health wings of the ministry will conduct the vaccination programme.
- Attempts shall be made to ensure people's participation as a move towards social mobilisation.
- EPI may call for creation of a new post of district medical officer.
- Vacant positions at field level shall be filled up to ensure at least one Health Assistant and a Family Welfare Assistant in each ward.

- Extensive training for officers and field staff at national and local levels by 1986 and 1987 respectively.
- Continued external agency support expected.
- Increased efforts to be made to involve NGOs and other organisations including Grameen Bank.
- Newly created MCH committees at national, district and upazilla levels shall ensure proper implementation of the steps undertaken, countrywide monitoring and coordination activities.
- Current system of distributing cold chain and other equipment from central store to district and from there to primary centres in boxes shall continue. It will be strengthened in such a way that by 1988-89, all the 560 primary and 13,530 rural centres including 120 in 4 metropolitan cities face no problem in getting the services easily.
- A proper system of cold chain equipment use and preservation was being planned on the completion of cold chain survey in 1986.
- Production of vaccines by the Institute of Public Health by 1987-88.

Implementation

The EPI has been carried out in phases of unequal length:

1 st Phase	:	1979 - 1985
2 nd Phase	:	1985 - 1993
3 rd Phase	:	1993 - 1995
4 th Phase	:	1995 - 2000

The programme has changed its implementation strategy at different points of time. This change occurred in spite of EPI being government programme executed by the Directorate of Health, of the Ministry of Health and Family Welfare. Until 1984, immunisation was carried out by specially engaged EPI technicians, and delivered through fixed centres only. During 1983-86, TT vaccination campaigns were conducted during the winter months in one thana (sub-district) of each of 21 greater districts. The HAs and Family Welfare Assistants (FWAs) jointly organised

vaccination sessions in each hamlet/para. Some donor agencies objected to the FWA's association in the immunisation programme. They feared that it would create a detraction from their main task in family planning. Field experience had also shown that vaccination session at selected homes was more effective than going door to door.

In 1985, during his speech at the UN General Assembly session, the President of Bangladesh reiterated his country's commitment towards Universal Child Immunization (UCI) by 1990. The Health Secretary and the Director of EPI visited Turkey to observe the successful Turkish case. UNICEF's Executive Director James P. Grant's visit to Bangladesh in the same year reinforced the national commitment (See chapter V).

The EPI plan was thus formulated with an ambitious target of 84% in 1990, from the meagre 2% of 1985. When the main thrust of the accelerated programme was initiated in 1986, the latest cold chain equipment and vaccination materials including sterilizers, syringes, needles, refrigerators, freezers and cold boxes were procured. Portable steam sterilizer sets facilitated the use of separate syringes and needles in each case.

The progress in coverage enhancement during the first three years was still not up to the mark. The Ministry at that point gave some flexibility in the vertical structure of the EPI programme. Issues pertaining to the National Mobilization Plan, chalked out initially but not been taken up, were now initiated. Other government agencies like the Cabinet Division, the Ministries of Education, Social Welfare, Local Government and Cooperatives, Women Affairs, Information, Communication and others were involved. New strategies of delivery, bringing services to the people were introduced. New staff at field level were recruited. Storage facilities were decentralised. New techniques of communication and mobilization such as use of print and electronic media were introduced.

The intensive immunisation scheme was gradually introduced in all the 460 thanas and 88 municipalities as follows:

Stages	Year	No. of Thana	No. of Municipalities
I	1985 - 86	8	10
II	1986 - 87	62	20
III	1987 - 88	120	34
IV	1988 - 89	270	24
	Total	460	88

Currently the EPI has one cold chain technician in each of 64 districts and one EPI technician in each of the 460 thanas financed from the revenue budget. Eighteen medical officers, three in each Division, 43 assistant store keepers, 10 cold chain technicians at 10 cold chain workshops and eight drivers are on the development budget. There are also 950 'runners' on a contingency basis. By 1988, the EPI had trained 1,060 managers, 11,700 health inspectors/supervisors, 19,600 technical assistants and 22,200 vaccinators.

UNICEF assigned full-time officer from each of its seven zonal offices to support the EPI programme and WHO stationed a representative at the EPI Headquarters in Dhaka.

Organisation of EPI at Thana Level

In rural areas EPI activities are coordinated by EPI Coordination Committees (CC) at thana, union and ward levels. The thana CC is headed by the Thana Health and Family Planning Officers (THFPO), Union CC by the local Chairman and ward CC by union council Member. In the thana, the THFPO, Medical Officer-EPI (MO-EPI), Thana Family Planning Officer (TFPO), MO-Maternal and Child Health (MO-MCH), EPI Technician, and Health and Sanitary Inspectors (HI and SI) undertake thana level planning, programming, coordination, training, and supervision of EPI service delivery. At the union level, the Assistant Health Inspector (AHI) and Family Planning Inspector (FPI) are responsible to oversee community level activities being carried out by the Health Assistants (HAs) and Family Welfare Assistants (FWAs). While the HAs and FWAs organise, implement and manage the vaccination activities at community level.

At the community level the HAs/FWAs select vaccination centres at convenient places, in consultation with the village leaders that may include schools, private houses or other spaces as available. As per the national guidelines, eight vaccination centres are organised per Ward* every month, and 24 per Union. Each vaccination session is conducted jointly by a HA and an FWA. They usually conduct 2 sessions a week. Many of the EPI centres have been transformed into a community level combined health and family planning service delivery post.

In the rural areas the EPI authority at the thana level does not play any role in setting targets for EPI; the targets are imposed from the top level. Targets are calculated on a percentage basis of the population. The target population in EPI includes children less than 1 year of age and women in reproductive ages (15-45 years) especially the pregnant women. Children 1-2 years of age attending the vaccination sessions are also immunised.

The HAs and FWAs through individual contact, and group meetings impart education about vaccination. This is mainly done during their routine household visits and vaccination sessions. Special strategies are planned and implemented for the 'hard-to-reach areas'.

At different organisational levels, monitoring and supervisions are conducted. The THFPO office prepares a plan for the purpose and allocates tasks to the supervisors. They include Assistant Health Inspector (AHI), Family Planning Inspector (FPI), Health Inspector (HI), Sanitary Inspector (SI), Medical Officer (MO) and Thana Family Planning Officer (TFPO).

The THFPO also coordinates the EPI tasks done by other agencies/sectors, such as NGOs and the Municipalities. The respective agencies are invited to attend the monthly meeting.

At most THCs, there is a EPI store room with required cold chain equipment (chest freezer, cold box, vaccine carrier, ice line refrigerator and thermometer). The thana EPI Technician is responsible to maintain proper cold chain. All the respective staff including the vaccinators have

* In each Union there are three wards; each ward has an average population of 8,000.

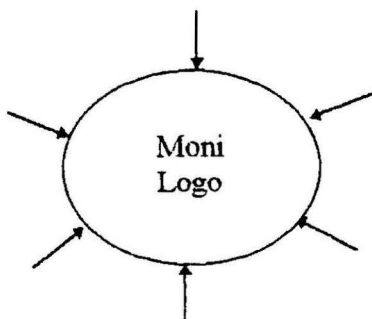
written instructions on cold chain maintenance. The THC receives supplies from the District Civil Surgeon (CS) office. The THC authority places demand for materials to the CS office routinely using a standard format. The porters/runners carry the supplies to a certain point where they are received by the HAs/FWAs and taken to the vaccination sessions. At the end of day's work, the unused vaccines are returned to the THC for storage in the cold room.

For reporting purposes, the HAs fill up tally sheets during vaccination sessions and send those to the AHI. The AHI consolidates the data each month and sends them on to the EPI technician. He consolidates the data unionwise and submits those to the MQ-EPI and THFPO. The THFPO reports to the Civil Surgeon (CS) at district level.

In urban areas the municipalities implement the EPI programme. EPI services are rendered through fixed and outreach centres, which are run either by the municipal authority itself or by NGOs. The municipalities have their own vaccinators. Sometimes Family Welfare Assistants (FWAs) are deputed by the THFPO to help in urban areas. NGOs carry out the EPI activities under the guidance of their own supervisors. Both the Municipalities and NGOs receive vaccines, and other logistics from the Thana Health Complex (THC).

Communication in EPI

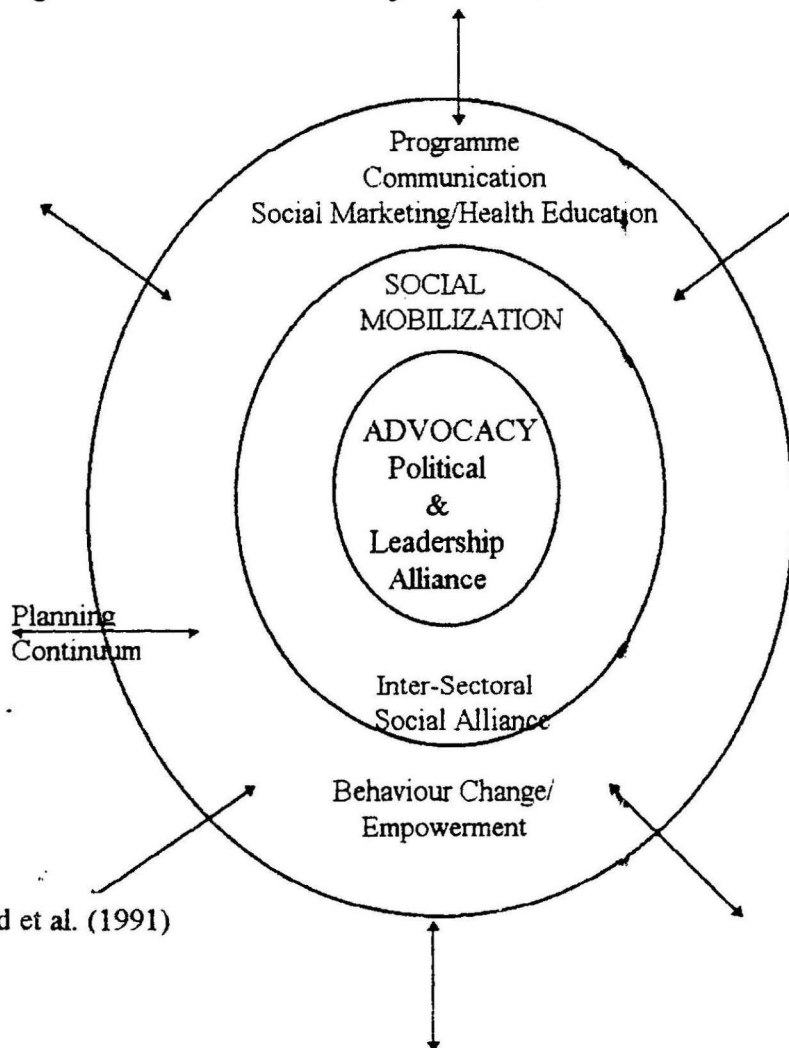
One of the first communication tasks for the intensified EPI was the search for a popular logo. Since *moni* represents endearment for children of both sexes, a character was drawn to suit the meaning of the term. The logo (see below) symbolised the six immunisable diseases and the ring of protection. Moni was placed everywhere to raise awareness and support demand creation (Haq, 1991).



During the first phase of the programme, the Health Education Bureau of the Government developed and distributed tons of communications materials. These had a great impact to arouse interest of various stakeholders at the initial stage of the programme (Talukder, 1986). The following gives a picture of the materials produced:

1983	20,000	posters
1984	100,000	leaflets
		Radio talk; Spots on radio and TV
1985		Ad in print media
	30,000	disease recognition posters distributed
	50,000	disease recognition folders distributed
	400,000	vaccination cards distributed
	10,000	posters on TT distributed

Figure 3.1: Programme Communication/Information Model



Source : Abed et al. (1991)

A programme on communication/information model (see Figure 3.1) was developed involving elements of advocacy, social mobilisation, alliance building and empowerment at the initiative of UNICEF. The communication programme in EPI purported to cover all the circles through various activities (see Abed et al., 1991 for details).

By 1988, media interest in EPI had grown significantly. Electronic media advocacy was supplemented by TV spots produced by BRAC, a leading national NGO. UNICEF's special ambassador for sports Imran Khan's visit to Dhaka in 1989, and that of Hollywood star Audrey Hepburn in 1990 along with promotional activities of the local film and TV stars added a new publicity dimension to the campaign. Furthermore, some multinationals and local entrepreneurs also let their products be used for the EPI campaign. The Dhaka Match Factory, for example, imprinted the EPI logo in their match boxes. Religious leaders belonging to different religions and groups also rendered their support. In short, EPI literally became a programme of the nation.

Production and Procurement of Vaccines and other Accessories

At present, the Government of Bangladesh imports BCG, OPV, DPT, Measles and TT vaccines, and diluents for BCG and Measles vaccines. These are imported from various manufacturing countries at the market rate negotiated by UNICEF. UNICEF, on behalf of the government, procures vaccines and vaccine related accessories. The UN procurement mechanisms, which can forecast vaccine needs for developing countries and purchase vaccines in very large volumes, make vaccines available at very low costs (Shin and Shahi, 1994).

According to newspaper reports (The Daily Janakantha, June 4, 1998), Bangladesh imports vaccines worth about Tk. 140 million annually. UNICEF's Annual Progress Report on health 1996 reported that Bangladesh covered 84% of its costs for vaccination from its own resources.

The government has no policy guidelines for vaccine development, production and marketing. It produces and distributes only Tetanus Toxoid (TT) vaccine covering about one-fourth of the total requirements of the country. The Institute of Public Health (IPH) is the only unit that produces vaccine since 1983. The IPH stopped TT vaccine production in 1991 due to doubts regarding its

vaccine quality. During December 1990, the EPI Bangladesh reported TT vaccine failures in some pregnant women immunised with TT manufactured at IPH. It was found that three batches of TT, tested externally in WHO approved laboratories, had unacceptable low potencies (Harshavardhan, 1994). An evaluation mission, jointly organized by WHO and UNICEF, inspected the Tetanus Vaccine Laboratory of IPH in April 1991. The mission identified some lapses in the production and test procedures of TT vaccine. By January 1992, IPH had modified and upgraded Tetanus Vaccine Laboratory according to recommendations made by the mission and production restarted in January 1992.

According to a senior IPH official, currently this institute has qualified staff in the TT production laboratory. However, there are constraints in some of the important requirements for TT production that hampers the regular production flow. One of the main problems is the supply of boiler steam that requires a production laboratory. The TT laboratory gets a supply of steam from the intravenous (IV) fluid section of IPH. The capacity of the boiler to produce steam is not sufficient to meet the requirement for both the IV fluid section and the TT laboratory. Another important problem is the procurement system that is very lengthy,

Moreover, many of the instruments that are being used in the laboratory since 1983 need to be replaced, but the unit has no funds to procure new instruments. Persons who are posted at different times to head the vaccine laboratories of IPH, did not have previous training in the sphere of vaccine production. Due to their lack of technical skill they could not manage the production properly.

Resource Mobilization

Funding for EPI came from different sources such as The Government of Bangladesh, multilateral UN agencies (UNICEF and WHO), bilateral donors (USAID, SIDA, CIDA, SDC, AIDAB, etc.), and international NGOs.

UNICEF provided 57% of the programme budget. The Swedish International Development Agency (SIDA), the Canadian International Development Agency (CIDA) and the Australian International Development Bureau (AIDAB) channeled their assistance through UNICEF. The

GoB's contribution accounted for 31% while Rotary International provided 8%. USAID contribution stood at 1% of the budget, and WHO's 3%.

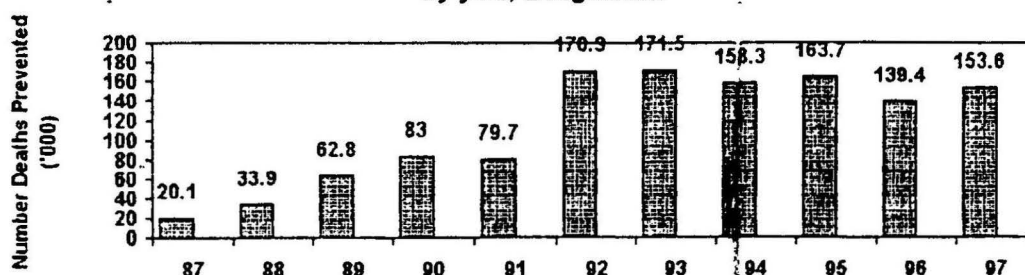
During the 4th phase (1995-2000), funding has been proposed from the World Bank as loan, and from UNICEF, USAID, WHO and the Japanese Government as grant. Total project aid sought was Tk. 2,352.0 million, calculated at an exchange rate of Tk. 41.50 per US dollar.

In a recent review, Khan and Yodar (1998) looked at the cost, cost-effectiveness and financing of EPI in Bangladesh. They estimated the resource need for 1998 at US\$ 18.3 million. It was found that the public sector provide US\$ 8.3 million which meant that the country needed to look for overseas support at the rate of US\$ 10 million annually.

Achievements of EPI to date

EPI in Bangladesh has come a long way since its introduction in 1979, and its intensification in 1986. The ultimate success of EPI will be assessed against how it achieves its various disease reductions and elimination goals. The success of smallpox eradication is well known and acknowledged. The extent of success in reduction and elimination of the other six diseases is not yet known. A recent review estimated the deaths prevented from vaccine preventable diseases (VPDs) for each year during 1987-97. It estimated that a total of 1.25 million deaths had been prevented (GoB, 1998) (see Figure 3.2). The coverage by different antigens may be considered a credible proxy for the likely impact of EPI. Apart from the routine information provided by the government from its service records, independent surveys carried out over the last decade have documented the picture systematically.

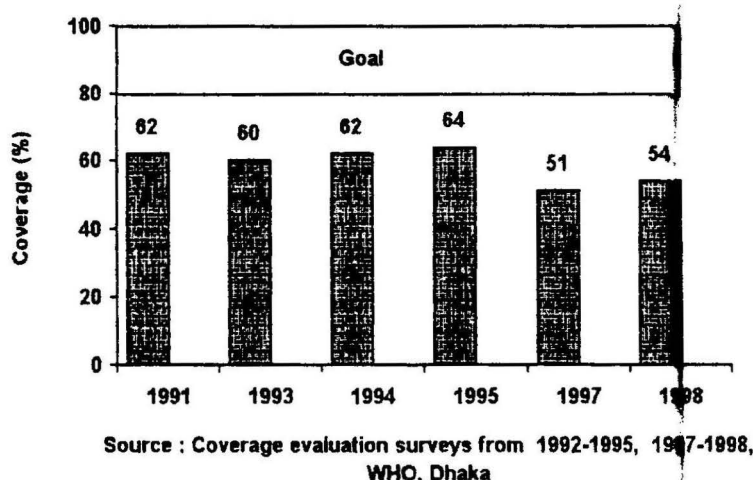
Figure 3.2: Estimated Number of EPI Deaths Prevented ('000) by Immunization by year, Bangladesh



Source: Routine EPI Reports (1985-91); Coverage Evaluation Surveys (1992-98); GoB

From a mere two percent in 1986 the coverage quickly rose to 62 percent in 1991, a 'near miracle' by any standard. Figure 3.3 shows the coverage over time, as reported by independent coverage surveys. It shows that the coverage reached its peak in the early 1990's and somewhat remained static or declined afterwards. It also shows that the coverage never reached the target of 85%. The reliability of the independent coverage surveys is corroborated by other surveys such as the 1996-7 Demographic and Health Surveys (DHS) (Mitra et al., 1997).

Figure 3.3 : National trend in coverage (fully immunized children, FIC) of child <12 months old by year of survey, Bangladesh

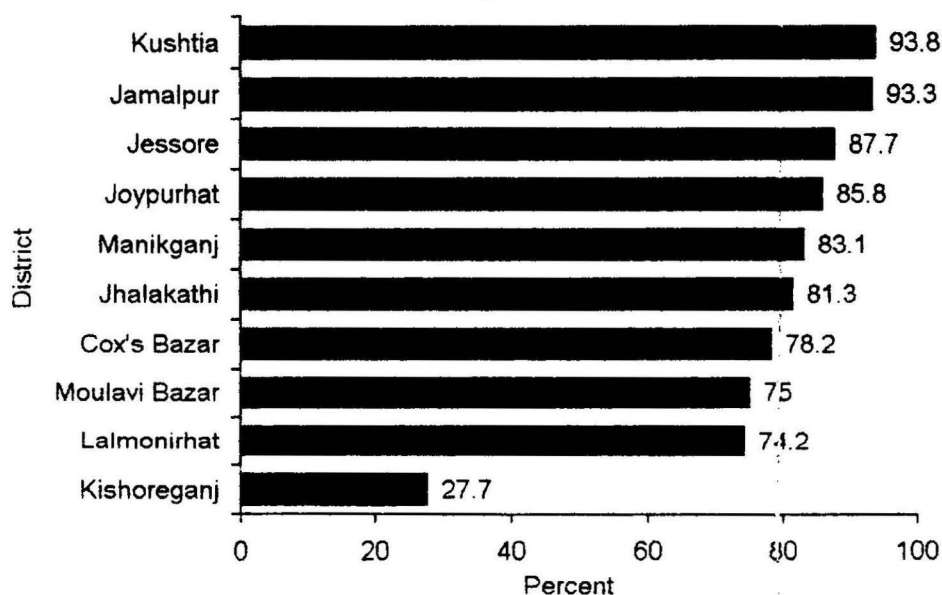


An analysis of the national coverage according to different antigens suggests a very high rate for BCG and a 'worrisome' dropout between BCG and the third dose of DPT/OPV. The recent EPI programme review, carried out by an international team of experts, mentioned very rightly that the coverage rate for BCG shows the level of access to health care in Bangladesh (GoB, 1998); 91% coverage of BCG shows what is achievable under the given socio-economic condition. The high dropout rate of 30% between BCG and Measles is a matter of concern. Chapters VII and VIII present information on this from the perspectives of demand and the quality of service as found in in-depth investigations carried out for this study.

The EPI and DHS surveys referred to above use a high level of aggregation. Another matter of concern often raised, therefore, is the difference in coverage between different geographical regions. Surveys carried out by BRAC on routine immunisation coverage indicate the existence

of this difference. Figure 3.4 shows the difference in proportion of children 12-23 months who were fully immunised in different regions. While the highest coverage of nearly 94 percent was recorded for Kushtia, the lowest was a meagre 28 percent in Kishoreganj. Another survey carried out by the same organisation following the 1996 National Immunisation Day (NID) also depicted a similar regional variation.

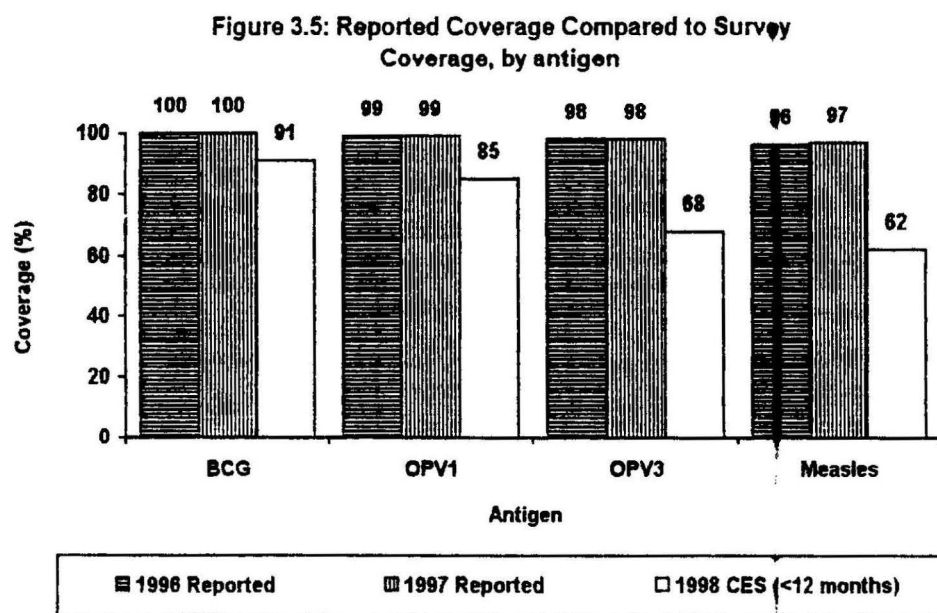
Figure 3.4: Coverage of child (12-23 months; FIC) by district, Bangladesh



Source: Hadi et al. (1995)

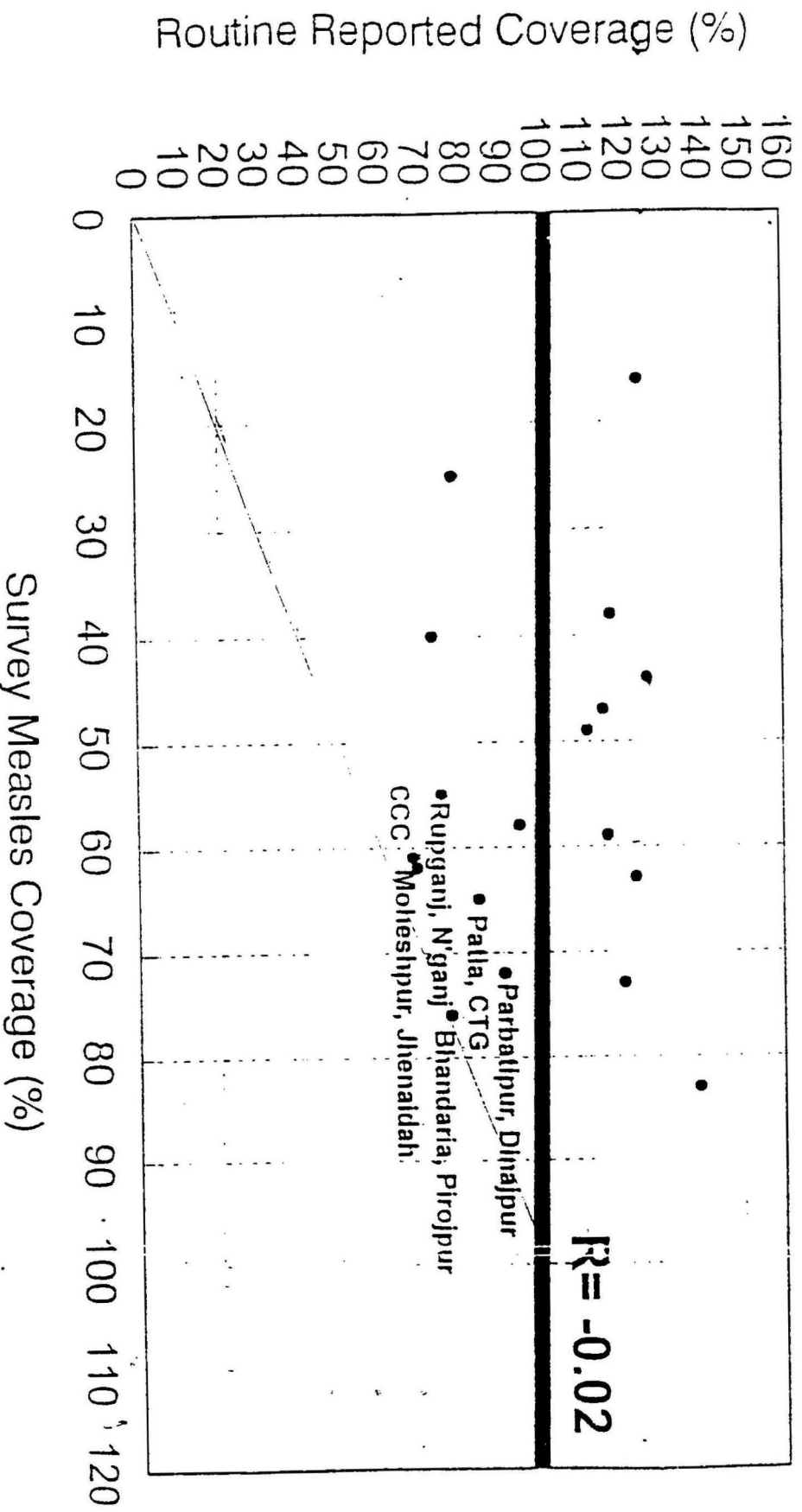
Another issue, also raised by the 1998 EPI review, is the variation between reported coverage and independent estimates of coverage (GoB, 1998). As Figure 3.5 shows, the difference is alarming for some antigens. For Measles, the reported coverage in 1997 was 97 percent while an independent survey carried out the following year found it to be only 62 percent. A study carried out in 17 thanas/municipalities compared the reported coverage with independent estimates, and Figure 3.6 shows the results. If the reported coverage from both sources were close to each other the spots would have hovered around the diagonal line. Unfortunately, the reported coverage was way above the independent estimates. In this respect the comment made by the 1998 EPI review on the issue is worth quoting:

This lack of correlation means that until this issue is resolved, administrative estimates of coverage as presently calculated, cannot be used to monitor national progress toward objectives (GoB, 1998).



Source: GoB (1998)

Figure 3.6: Comparison of reported and independent coverage in 17 thanas/municipalities



Source: 1998 Coverage Evaluation Survey and 1997 EPI Routine Reports

Figure 3.6: Comparison of reported and independent coverage in 17 thanas/municipalities

The following chapters give more information on these and other aspects of how EPI is implemented in the field.