

## Editorial

### **Polio eradication & the future for other programmes: Situation analysis for strategic planning in India**

Polio eradication has not gone according to plan. Erstwhile promoters now admit that polio might never be wiped out<sup>1-4</sup>. Many basic tenets of the programme (relating to both the virus and the vaccine) are being challenged. It is now apparent that the world cannot withdraw vaccination in the near future.

*The crafty virus:* The virus has proved more resilient than expected. Local strains resurfaced in Sudan after five years<sup>2</sup>, in Albania polio reappeared after two decades<sup>5</sup>, and in Kenya after 22 yr<sup>3</sup>. Circulating vaccine-derived polioviruses (cVDPVs) and rare chronic excretors of poliovirus have been identified newly<sup>6</sup>.

*Vaccine efficacy:* In India many who have received 10 doses of OPV have contracted poliomyelitis raising doubts about the efficacy of vaccine in some populations<sup>2,3</sup>. Enteric infections, poor nutrition and poor sanitation are being blamed<sup>3,7</sup>. This belated acknowledgement that public health problems cannot be solved by magic bullets alone (repeated doses of OPV) may be one of the gains from this misadventure. Now monovalent OPV (mOPV)<sup>8</sup>, birth dose of vaccine<sup>8</sup> and inactivated poliovirus vaccine (IPV)<sup>9</sup> are being suggested, without clear evidence that any will work<sup>9</sup>. What is evident is that they will escalate costs several fold. 'As long as there are things we haven't tried, the polio team remains optimistic' says an article in *Science*<sup>2</sup>, as if there is merit in using untested remedies.

*The strategic planning process:* There is a need for India to develop a strategic plan for future eradication programmes. Strategic planners

suggest a three stage process - Situation analysis, Target setting and Path routing. The first stage involves situation analysis *i.e.*, evaluating and analysing the current situation and how it came about. The second component target setting involves defining goals and objectives for the future. The third component path routing involves defining a map or path to achieve the goals. In this annotation we perform a limited situation analysis and briefly allude to a possible target and route.

#### **Situation analysis**

*Background:* In 1984, Rotary International declared 'eradication-polio by 2005' as its goal (for no stronger reason than, that 2005 was the Rotary centenary year<sup>5</sup>). In the 1988 World Health Assembly, urged by the WHO, 160 member states committed themselves to eradicate polio by the year 2000. Polio eradication was not a public health priority for developing countries<sup>10</sup>. In India polio cases had come down from 24,257 in 1988 to 4793 cases in 1994 with the help of routine immunization, well before the 'eradication programme' started in India<sup>11</sup>. In those days all cases of acute flaccid paralysis (AFP) with residual paralysis beyond 60 days were diagnosed as polio<sup>11</sup>.

*Programme funding:* The Pulse Plus programme began in India with a US\$ 20 million grant<sup>5</sup>. The polio eradication programme started in 1995. Soon afterwards, 'donor fatigue' set in<sup>12</sup>. The

government was left to borrow US\$ 180 million from World Bank for the programme<sup>13,14</sup>. This pattern is the norm with international funding. Resolution 45.17 of the World Health Assembly mandates that newer vaccines that are cost-effective be integrated into the national immunization programmes of member countries. Funding agencies like Global Alliance for Vaccines and Immunization (GAVI) circumvent this essential step of cost-effectiveness evaluation by providing poor countries with grants. Vaccine cost comes to zero, and countries are persuaded to initiate the programme. Funding is withdrawn after a couple of years, and nations are effectively lured into a debt trap<sup>15</sup>.

*Residual paralysis in non-polio AFP:* Concentrating on this programme resulted in a decline in routine immunization and increase in incidence of vaccine preventable disease<sup>1,16,17</sup>. There was also an unexplained increase in AFP - especially non polio AFP. In 2005 there were 10,055 non polio AFP cases in Uttar Pradesh (UP) where 561 cases were expected<sup>11</sup>. A delegation from the Public Report on Health (PRoH) (Council for Social Welfare, New Delhi) in November 2006 investigated the problem of residual paralysis in 'non polio AFP'. The PRoH found that most cases of AFP were not being followed up (unless they cultured virus in the stools). Information

provided under the Right to Information Act and available from National Polio Surveillance Project (NPSP) is shown in the Table<sup>8</sup>. Of the 10264 cases of AFP, 209 were cases of polio or compatible with polio. Of the remaining 10055, only 2553 were followed up; of these, 898 had residual paralysis (that would qualify them to be diagnosed as polio using the old definition) and 217 died. Projecting these figures on those not followed up, it will appear that approximately 4800 cases had residual paralysis or died in UP after acquiring non polio AFP in the year 2005. This figure must be compared to the all India figures of 4793 polio cases in 1994<sup>11</sup>. It is not surprising the NPSP is not keen on the follow up of these cases. The data from 2006, after 6 doses of mOPV had been administered in 2005, in districts of UP, are worse<sup>8</sup>.

*Benefits claimed:* WHO claims five million children have been saved from polio paralysis<sup>18</sup>. It is instructive to see how this figure is arrived at. In 1988, there were 32,419 cases of paralytic poliomyelitis<sup>19</sup>. The WHO arbitrarily raised this number ten-fold to 350,000 claiming incomplete reporting<sup>5</sup>. In 2004 with the changed definition, only culture positive paralysis was considered polio and there were 2000 such cases. Subtracting 2000 from 350,000, the WHO calculated that 348,000 children were saved from paralysis that year.

**Table.** Fate of 10055 cases of non-polio AFP in 2005 in Uttar Pradesh

	NPEV	NPEV+vaccine-virus	Vaccine-virus	No virus	Total
Follow up/total cases	616/3875	183/184	652/661	1100/5333 +2 missing numbers	2553/10055
Death	37	18	19	143	217
Residual paralysis	218	35	125	518 +2 missing numbers	898
No residual paralysis	361	130	508	439	1438
% residual paralysis	35	19	19	47	35.1
% death	6	9.8	2.9	13	8.5
% residual paralysis or death	41.4	28.9	22.1	60.0	43.7
Lost to follow up	3259	1	9	4233	7502
Projected total paralysis or death	1408	53	146	3205	4812

NPEV, non polio enterovirus

Source: Ref. 8

Other instances of over-simplifications and misleading data were brought out at the India Expert Advisory Group (IEAG) meeting<sup>8</sup>. The NPSP calls it a laudable trend that vaccinated children are getting polio because it shows more children are being vaccinated. It uses a hypothetical illustration. Assuming the vaccine was 90 per cent effective, if the disease affects 10 per cent of the non-immune, when 10 per cent of the population is vaccinated, 99 per cent cases will occur among the non-vaccinated and only 1 per cent will occur among the vaccinated. When 90 per cent are vaccinated, 50 per cent of the cases will occur among the vaccinated. This was a good sign that vaccination coverage had improved. The UP government pointed out that it should result in overall reduced numbers, not an increase as seen in the State<sup>8</sup>. The issue of artificially bringing down the number of vaccine induced polio cases was also brought up<sup>8</sup>.

*Proposed exit strategy:* This strategy has been discussed recently<sup>20</sup>. The WHO acquired the authority to issue 'travel alerts' during the SARS outbreak and there is speculation if this would be legal to use in the context of polio. A policy of 'name and shame' is however planned and this has started<sup>6</sup>. 'Name and shame' cannot justifiably apply to India, which has faithfully followed all WHO directives. The effort is more to 'name countries and shift blame' for the failure of a poorly thought-out programme.

*Target setting and path routing:* The presentation of the UP government to the recent IEAG meeting suggests that a ground swell of opinion is beginning to question the science behind these grand projects. This is a positive development. We need mechanisms to evaluate such programmes in the future. The target of the strategic plan could be the setting up an independent body similar to the National Institute of Clinical Excellence (NICE) in the UK<sup>21</sup>. It should be a statutory body made up of health professionals, epidemiologists and health economists to evaluate vaccines and other public health programmes. The path used to arrive at rational decisions can be a synthesis of clinical and health economics data. Cost-

benefit, affordability and allocative efficiency need to be evaluated in the context of social values with inputs from a citizens' council. Details of these tools have been described elsewhere<sup>22</sup>.

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