

## CORRESPONDENCE

### DPT and poliomyelitis in developing countries

In the September 1997 issue of *Current Science*, Wyatt has expressed his opinion that the immunization policies of the World Health Organization (WHO) which had not been prepared with due attention paid to potential but known adverse reactions and their mindless adoption into immunization practices by the Ministry of Health and Family Welfare (MoHFW) of India, had contributed to the development of paralytic poliomyelitis in large numbers of children during the decade of the 1980s (ref. 1). He recommended that 'we must face unpleasant facts and report them honestly, not only because this is right and ethical, but also to prevent future misfortunes'<sup>1</sup>. This is very courageous and candid advice, especially coming from a western expert.

India had been badly misled and had committed 'Himalayan' blunders regarding the immunization, prevention and control of poliomyelitis<sup>2-4</sup>. Policies made in Geneva are not always technically the best suited for our needs or circumstances, nor necessarily in our best interests. This is not to belittle or underestimate the great role the WHO has played for the improvement of the health of humankind. However, in some instances the WHO experts took observations from one situation, often from the West, and evolved policies for India and other developing countries, assuming that the same would apply equally well everywhere. Where there was dissenting opinion regarding the validity of 'one policy for all countries', based on locally documented observations, the WHO experts did not examine the basis of the dissension, but ignored the caution and misled countries such as India. No one had been bold enough in the past to point this out. That is why I believe that Wyatt has been courageous to open up this unsavoury aspect of contemporary public health

history. Wyatt found it 'difficult to understand how papers published in Indian journals have been so completely forgotten'<sup>1</sup>; in reality they were not forgotten, but were ignored because they contradicted WHO policy. So far the error could be considered as genuine, attributing more authority and less knowledge and wisdom to the WHO experts. However, if they have used their authority and influence on the officials of India's MoHFW to prevent them from objectively examining the issues and suitably modifying the policies, thereby causing injury and injustice to our children, then the mistake takes a more serious turn. The Government of India must investigate this question if we take Wyatt's advice seriously. Did the experts consider their prestige more important than the lives of our children?

Prior to the launch of the Expanded Program on Immunization (EPI) of the WHO in 1974, a series of careful investigations initiated at the request of, and financially supported by, the WHO, had clearly shown that in India three doses of oral poliovaccine (OPV) were inadequate to achieve optimum vaccine efficacy (VE), which is the pre-requisite for predictable personal protection and for the control and eventual elimination of poliomyelitis in the country<sup>5-9</sup>. The WHO experts were fully aware of the data through the submitted research reports and through the papers published in Indian and American journals<sup>5-9</sup>. In order to uphold scientific principles, all the WHO had to do was to simply acknowledge that there are 'geographic' variations in VE and to allow flexibility and freedom for countries such as India to understand that the WHO policy of primary immunization with three doses of OPV was only a guideline and the minimum, rather than as a rigid rule upon which the

reputation of their experts depended. To compound the error, the WHO maintained that 85% immunization coverage was sufficient, condemning 15% to deliberate non-immunization. These policy errors were, among others, two important reasons why the intensity of transmission of polioviruses continued for over a decade even after launching the EPI, thus contributing to 'provocation' and 'aggravation' poliomyelitis when intramuscular injections including vaccines were given. Only after the arbitrary target of 85% was removed and consequently coverage surpassed 90%, did the reported numbers of polio cases begin to decline, from 1989, 12 years after commencing EPI<sup>2</sup>. Wyatt's main point is about the lack of recognition (by the experts of WHO and MoHFW) of the risk and probability of paralytic polio in children due to 'provocation' and 'aggravation' by intramuscular injections, particularly with the diphtheria-pertussis-tetanus vaccine (DPT). That the families who obeyed the MoHFW directive and brought their children for immunization were put at risk is a serious issue in ethics, particularly when we realize that the inadequacy of three doses of OPV and the risk of provocation of polio by injections were well-known facts which had been ignored<sup>1,2,10</sup>.

The need to find a way to obtain optimum VE of OPV was urgent in India before the establishment of EPI in 1977. By continuing the WHO-initiated investigations, a simple and eminently practical solution was found by way of giving five doses of OPV during infancy<sup>11,12</sup>. This recommendation was not accepted by the MoHFW when it launched the EPI in India, presumably on the insistence of the WHO experts. When a 'fully immunized' child later develops polio, it is called 'vaccine failure'<sup>13</sup>. Only by WHO

and MoHFW definitions but not by scientific evidence, is a three-dose OPV recipient considered 'fully immunized' in India and many tropical and subtropical developing countries. The world's first cases of 'vaccine failure' polio cases had been described in India in 1972, even before the launching of the global EPI<sup>5,7</sup>. During the decade of 1980s, an estimated one million children have developed 'vaccine failure' polio in our country as a result of the strict restriction to three doses of OPV. Once again, those who trusted the government programme were the ones who were misled. In private practice, the five-dose idea caught on rapidly, and the Indian Academy of Paediatrics endorsed it; yet, the government remained adamant against it. The cost of a dose of OPV was as low as 10–20 paise; so it was not the cost factor that prevented the MoHFW from adopting a five-dose immunization. As if for penance for past mistakes, we are today forced to offer 15 doses per child, buying OPV at about 3 rupees per dose, and to follow the WHO experts blindly while they lead us to polio eradication. I am afraid that on 31 December 2000, the target date for global eradication of polio, India would have failed to interrupt the transmission of polioviruses, in spite of the heavy financial burden we are shouldering at the behest of WHO experts. With more self-reliance we could and should have eliminated poliomyelitis more than a decade ago at a fraction of the cost.

Introducing the wide scale use of DPT into a country hyperendemic for poliovirus circulation, without taking reasonable measures at least to protect individual children against polio, or to reduce the intensity of poliovirus circulation in the community, or both for adequate safety assurance, was unwise and unscientific from policy point of view and cruel and tragic from human rights point of view<sup>1,2</sup>. Injecting DPT was unavoidable as protection from diphtheria, whooping cough and tetanus are very important; but failing to understand that the intense circulation of polioviruses would have caused provocation poliomyelitis was indeed a mistake that should have been avoided by removing the restrictions of the WHO policies of three doses of OPV and 85% coverage.

In 1981, I had pointed out the need for a national policy on poliomyelitis through a paper published in an Indian

journal, in which all the issues raised above were discussed<sup>14</sup>. If a three-dose rule was sacrosanct, then injectable poliovaccine (IPV) had been shown to be superior. Did WHO have any vested interest in the exclusive use of OPV? Why did the MoHFW withdraw from the Indo-French collaborative agreement to manufacture microcarrier-grown vero cell-based IPV, rabies vaccine and measles vaccine in India, even after the technology transfer fee was allegedly paid? Have investigators been prevented from publishing their results of studies using IPV in India?

If the exclusive use of OPV was sacrosanct and a five-dose primary immunization was an affront to WHO's prestige, then a totally different and innovative tactic, called 'pulse immunization' was designed, field tested and shown to be the best answer to the problem of polio in India<sup>15–17</sup>. It is reasonable to extrapolate from the field studies and state here that pulse immunization, if planned properly and conducted with the same efforts as we have done during the last two years, we could have eliminated polio at least a decade, possibly one-and-a-half decades, ago<sup>15–17</sup>. What was rejected in India as being against the policy in 1981 till 1994 was accepted in 1995, by which time an estimated 3–4 million children had developed paralysis due to lack of immunization, inadequate number of doses, or provocation and aggravation by injections, a tragedy that could have been avoided for the most part.

There are, currently, major flaws in India's strategy of polio eradication under the exclusive direction of WHO policies. First, disease surveillance should have been designed and started long ago (and certainly before launching the pulse immunization campaigns) to monitor *clinical paralytic illness* in all parts of the country. That simple lesson was published in 1981 and 1983, but was ignored<sup>15,16</sup>. There is no such systematic surveillance covering the entire country as yet. By mislabelling sentinel surveillance for polio (or small scale sample surveys for HIV infection) as 'national surveillance', the public health personnel are lulled into complacency, but in reality we cannot assess where we have reached in terms of polio eradication (or HIV control). In both these issues, polio eradication and HIV/AIDS control, we are

allowing ourselves to be misled, repeating history. Second, the monitoring of the *circulation of polioviruses* is ill defined and grossly insufficient. The final proof of polio eradication is the consistent absence of polioviruses in spite of proper search. The parameters of 'proper search' may be different in India, from those in western countries or in Latin America. One error here will set the clock of global eradication of polio backwards and India will be responsible; as in the past, WHO experts can conveniently wash their hands off us.

Without creating these two modalities, *disease surveillance* and *monitoring of polioviruses*, pulsing OPV is to put the cart before the horse. As soon as these two monitoring modalities are ready, then annual three-dose pulses with OPV would succeed in eliminating poliomyelitis and interrupting the transmission of polioviruses in the shortest possible time, probably two years, perhaps three<sup>16</sup>. In the absence of these two systems in operation we have caught the proverbial 'tiger's tail' by commencing the annual two-dose pulse polio immunization; we cannot let go of it since polioviruses will continue to circulate for years. Even if transmission ceases, we have no reliable way to convince ourselves and others with evidence; so we will have to continue until the clinical and virological monitoring systems are developed and fine tuned. These may take several more years, and until then, we must continue the exorbitantly expensive pulse immunization. If we discontinue pulse immunization, polio will reappear with a vengeance. Meanwhile we must import all the poliovaccines, as I understand that Indian vaccine manufacturers have been prevented from indigenizing OPV production. We must now ask why the one successful OPV manufacturing unit at the Pasteur Institute, Coonoor was closed down by Government decision in 1974: was it in anticipation of the establishment of EPI, so that all OPV would be imported as long as necessary? Most of the players of this drama are still alive and it is the duty of the Government to face unpleasant facts and report them honestly for the sake of our honour and future.

Honest, open and detailed deliberations by Indian health scientists, officials of MoHFW, experts of the Indian Council of Medical Research and representatives of the Indian Academy of Paediatrics and

the Indian Medical Association are necessary at this critical juncture in India's pilgrimage towards total freedom, both from the viruses of slave mentality and lack of accountability as well as from polioviruses.

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## Bacteria around hydrothermal vents

A. V. Sankaran's research news (*Curr. Sci.*, 1997, **73**, 495) gave information on the bacteria present deep inside the earth. I would like to add the important findings of Holger Jannasch and his colleagues<sup>1,2</sup>, who discovered a preponderance of sulphur-oxidizing chemolithotrophic bacteria around the hydrothermal vents. Actually, the milky-bluish water of these warm vents contains masses of *Thiomicrospira*, which oxidize the hydrogen sulphide and thiosulphate present in the vent water. *Beggiatoa*, another sulphur-

oxidizing bacterium, was also found near the vents. In addition, microbiologists discovered geothermally methane oxidizers (methylophilic bacteria). Some of these bacteria live symbiotically with animals of deep-sea vents. The deep-sea vents are the first environment discovered in which chemosynthesis is responsible for primary productivity. This exciting discovery of the deep-sea vents has given microbial ecologists an entirely new ecosystem to study and understand.

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## NEWS

### Monsoons: Past, present and future\*

During the past three decades, there has been a remarkable progress in the understanding of the variability of the monsoon. Monsoon variability occurs on many time scales. They span the range of a few weeks to a few thousand years. In the last three decades, observations and computer models have identified the mechanisms that govern the variability of the monsoons on different time scales. These

developments were discussed in a discussion meeting on 'Monsoon: Past, present and future' held in Orange County (Coorg) in November 1997.

In his opening remarks, R. Narasimha (Indian Institute of Science and JNCASR) stressed the need to consolidate the knowledge we have gained during the past three decades about the variability of the monsoon. D. R. Sikka (former director, Indian Institute of Tropical Meteorology, Pune) provided a historical perspective of monsoon research in India over the last 120 years. He suggested that the monsoon research in India had three different epochs. These epochs were 1875-1947, 1948-1980 and 1980-1997. During the first epoch (i.e. 1875-1947)

the meteorological observational network was established. During this period it was apparent that the prosperity of India was inexorably linked to the summer monsoon rainfall all over India. The long-range forecasting of the monsoon began more than 100 years ago when H. F. Blandford discovered an association between snowfall in Eurasia and the Indian summer monsoon rainfall. Gilbert Walker, who was the Director General of Observatories in the early part of this century, discovered the association between all India monsoon rainfall and the large-scale oscillation in surface pressure in the southern hemisphere. He termed the see-saw in surface pressure between the West Pacific Ocean and East Pacific Ocean in

\*A report of the discussion meeting on 'Monsoons: Past, Present and Future' held from November 20 to November 22, 1997 in Orange County (Coorg). This meeting was co-sponsored by Indian Academy of Sciences and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR).