Chapter 4

Supplementary Immunization
Maria’s children were among approximately nine million who received the polio vaccine that day.
Extra doses of vaccine

Supplementary immunization – one of the key strategies for eradicating polio – means, very simply, giving children extra doses of polio vaccine in addition to those they should have received as part of their regular health care. In routine immunization programmes, children are given three (or in some countries four) doses of polio vaccine in their first few months of life. Additional doses do not cause any harm. But why should children need extra doses of vaccine if they have already had enough to protect them from polio?

Sometimes the easiest way to make sure most people have enough of something – be it money, food or vaccination - is to give some to everyone, rather than looking specifically for those who have missed out. Those who already had some will get more, which they may not need, but those who had none will now have enough for their needs.

Although giving people vaccinations which they do not need means that some vaccine will be wasted, it may be more wasteful to spend time, energy and money trying to target the vaccine to only those who have not received any.

In many countries – even those with highly developed health systems - it is not easy to find out what vaccinations a child may have had. The parent or caregiver may not know or
remember, or may have lost the child’s immunization card. The information may be recorded in different health centres in different parts of the country, or not at all. If parents are asked to find information and bring the child back later, the opportunity for vaccinating may be lost. Vaccination can easily be put off or forgotten: there is no pressing need for parents to take children to the health centre if they do not show any signs of illness.

Finding out a child’s vaccination status is difficult and may cost a considerable amount, if it can be achieved at all. OPV costs only a few cents per dose and is not harmful even if more doses than are strictly necessary are given. Vaccination is as important for the community as it is for an individual child. It makes sense, therefore, to give a child extra doses of OPV when everyone else is getting it - even if he or she may already be individually immune - to ensure that the level of immunity in the community is raised.

**Reaching everyone together**

There are advantages in giving vaccine to all children at the same time. Clearly, if many children have not been vaccinated before, the level of immunity in the community will rise dramatically if large numbers are vaccinated together. Moreover, when large amounts of vaccine poliovirus are released into the population at the same time, the weakened live virus may circulate among the children, creating immunity even among some who were not vaccinated directly.

Practical considerations, too, make it a good idea to aim to reach all children at the same time. A large event can be organized and publicized widely, ensuring that everyone is aware of the time and place that vaccine will be available, as well as the importance of the occasion. Workers – both professional and volunteer - can be organized for short, intense periods more easily than for ongoing endeavours.

**Supplementary immunization activities**

Large-scale supplementary immunization activities in those countries which were still reporting cases of polio were the public face of the polio eradication initiative. They excited people’s imagination, and gained a lot of support for the endeavour. They were responsible for the most dramatic declines in the rates of polio in the Region.
However, countries in the Western Pacific Region were at different stages with respect to polio eradication at the beginning of the initiative. In some, polio had not been seen for many years. In others, it was still widespread. Clearly, different countries needed different approaches. Most countries in the Region did not need to carry out widespread supplementary immunization activities.

The countries which did carry out supplementary immunization activities were those in which polio transmission was endemic at the beginning of the initiative: Cambodia, China, the Lao People’s Democratic Republic, Papua New Guinea, the Philippines, Viet Nam and also Mongolia (which joined the Western Pacific Region later, in 1995). The formula was the same, but each country had to adapt it to its own requirements. Each had a different setting and different experiences, the sum being a great deal of learning about polio specifically, and large public health endeavours in general.

**Getting started: early supplementary immunization in China**

China had developed a national plan of action for polio eradication very early on, in 1988, even before the regional strategies were developed. In that year, reported polio cases were fewer than ever before. Emphasis was at first placed on routine immunization. That proceeded well, with more than 85% of children in each province having been vaccinated by 1989.

However, in 1989 a large outbreak of polio began in eastern China, occurring in pockets of underimmunized areas. That was to spread to large parts of the country over the next three to four years. Almost 10,000 cases of polio were reported by the end of 1990. Spurred on by that, six provinces implemented the first supplementary immunization campaigns during the winter of 1990-1991, with 71 million doses of OPV administered. Each province determined for itself the timing, location, target age groups and number of rounds that would be carried out. In the winter of 1991-1992, with the epidemic continuing, eighteen provinces each conducted at least one full round of supplementary immunization. A year later (1992-1993), 186 million doses of OPV were distributed in supplementary immunization rounds in twenty-nine of the thirty provinces.
Running a province-wide supplementary immunization campaign is no small task in China, where each province is larger than many countries in other parts of the world. However, a review in May 1993, organized by the Ministry of Health with WHO participation, showed that the provincial supplementary immunization campaigns had not been fully coordinated, with vaccine given in different months even within the same county, and relatively large numbers of children missing out on vaccination in some areas. The review recommended that a national immunization day was required in China to coordinate vaccination dates and ensure that a higher proportion of children was reached.

**National immunization days**

National immunization days (NIDs) had already been proven to be an effective strategy for stopping the spread of wild poliovirus in countries in which it was endemic, long before they were used in the Western Pacific Region. The formula which had been developed by WHO was to give a dose of OPV to every child in the country under the age of five years - regardless of previous immunization status – in each of two rounds, four to six weeks apart. Each round should be carried out over as short a time as possible. National immunization days should be carried out during the low season for poliovirus transmission – usually the cooler, dry season.

In the Western Pacific Region, variations on that theme were used for a number of reasons. Because of the shortage of vaccine, the target age group in some areas was children under four years of age, rather than all those up to five years. For the same reason, and also because some countries were not confident enough initially to organize such events on a nationwide basis, some provincial and subnational immunization days were held. In some areas it was found that conducting each round over one to two weeks, rather than in one day or a few days, meant that workers had time to reach more remote villages. And in some countries, different districts were targeted sequentially because of the limited numbers of skilled staff, or in different months because of climatic differences.

**Planning for national immunization days**

National immunization days did not just happen on their own. Each round took a lot of detailed planning to ensure that enough vaccine was available in the right place at the right time,
that trained vaccinators were present to give it to the children, and that the greatest possible number of children either came to the vaccination post or were found by vaccinators wherever they were.

The amount of vaccine needed had to be worked out by multiplying the estimated number of children in the target age group by the amount of vaccine needed for each child, and adding a wastage factor to allow for the fact that not all vaccine would reach the children it was intended for. (A little too much might be given to one child, or children outside the target group could be given vaccine, or some vials could be spoilt by being dropped or exposed to heat, or vaccine remaining at the end of the day would have to be thrown away.) Requests for vaccine had to be submitted to the Interagency Coordinating Committee, with clear documentation on how the estimates were derived, well ahead of time. Because of the early shortage of funds for vaccine and the very large amounts needed, calculations had to be as accurate as possible. The Western Pacific was the first Region to face those challenges on such a scale, and so was forced to develop very precise methods of planning for NIDs.

Then there was the matter of getting the vaccine to the places where children would be. Venues for immunization stations had to be organized in every area. That often involved detailed planning with maps, and required local knowledge of the transport routes and population movements. Enough cold boxes, ice, refrigerated vehicles, and other equipment to transport large quantities of vaccine around the country at the same time had to be procured.

In some countries there were enough trained health staff to administer vaccine to all children. In other places, volunteers had to be recruited and trained to give OPV. Volunteer time was needed everywhere to support the vaccinators by bringing parents and children to vaccination stations, taking mobile teams to isolated settlements, finding unvaccinated children, translating between different languages, and giving assistance in many other ways.

Leading up to each round of each immunization day, mass publicity was needed to inform parents of where they could take their children, and why it was important for children to receive OPV.
In countries where injectable vaccines were given during national immunization days, arrangements were even more complicated. Needles, syringes, steam sterilizers and trained health staff had to be available at each post.

Every national immunization day also had to be evaluated so that the next one could be improved. Careful records had to be kept of the numbers of children immunized so that coverage (the percentage of children in the target age group vaccinated) could be calculated. Coverage surveys were carried out after each NID to assess whether reported coverage accurately reflected the actual situation. That practice was established starting with the first NID in the Philippines in April 1993. In China, a rapid assessment tool was later developed to check the immunization status of a sample of children in a range of areas, including expected problem areas, immediately following the NID, to assess coverage and whether any areas had been missed.

Planning for national immunization days took months and involved people at many different levels, from senior health staff to volunteers in remote villages.

The first national immunization days: the Philippines

The first full-scale national immunization days in the Western Pacific Region were held in the Philippines in April and May 1993. They were a great success, with about nine million children (over 85% of all children aged under five years) receiving additional doses of OPV.

Political support from the highest levels was very important. President Fidel Ramos signed a proclamation launching national immunization days for the next three years. The Secretary of Health, Dr. Juan Flavier, personally negotiated the “Ceasefire for Health” to allow immunization of children in rebel-controlled areas, as well as working tirelessly at promoting the NIDs through public appearances, media interviews and personal visits to staff and volunteers at all levels of the campaign. At the provincial and municipality levels, many governors and mayors served as NID coordinators.
The involvement of many different people and sectors was necessary. Fortunately, the Philippines already had a strong tradition of collaboration between different groups. International partner agencies such as Rotary and UNICEF provided vaccine for the NIDs. The Department of Health led the organization of activities, and other government agencies, such as the Departments of Education, National Defence, and Social Welfare participated actively. The business community also contributed, both financially and through direct involvement in NIDs, for example by lending their shops or offices as venues for immunization, or their vehicles and personnel to help with transport. Members of civic organizations gave money and volunteered their time. Local celebrities produced promotional messages, which were aired on TV and radio and at movie theatres.

The primary reason for the NIDs was to give polio vaccine. Starting from the second NID, however, the opportunity was also taken in some areas of the Philippines to give measles vaccine and vitamin A to children to help their immune systems, and tetanus vaccine to women to protect them and their babies from contracting tetanus during childbirth. They were also given as supplementary doses, that is, regardless of whether people had received them before. Not all immunization posts gave the extra substances. Vitamin A was only ever given during one of the NID rounds: two supplementary doses of vitamin A one month apart would be too much for children and could lead to side effects.

The Philippines’ national immunization days were successful on several levels. They achieved their objective of reaching almost all children under five years with OPV. That undoubtedly contributed to eradicating wild poliovirus in the country; the last time the virus was found in the country was between the two rounds of the first NIDs. They also provided the first health service ever to some people in the rebel-held areas, and certainly reached many other people normally beyond the reach of regular health services. The NIDs model was used further in the Philippines for other health programmes. “National micronutrient days”, in which a follow-up dose of vitamin A was delivered to all children aged one to four years, six months after each of the NIDs, were the most successful. Soon after the first NIDs, the Government tripled the budget for vaccine purchases. Thereafter, the Philippines was much less dependent on outside help for provision of vaccines.

Full-scale NIDs were run in the Philippines for five consecutive years, from 1993 to 1997, followed by further supplementary immunization in selected areas in 1998 and 1999.
“The largest public health event ever”
- China’s first national immunization days

By late 1993, China had considerable experience in running supplementary immunization activities in many provinces. The first full-scale, national immunization days in China were held in the winter of 1993-1994.

In September 1993, with approval of the State Council, a national conference was held to review the 1988-1995 National Plan of Action for Polio Eradication, and to discuss strategies for implementation of the first of three coordinated NIDs. Participants included high-level political leaders, such as, Ms Peng Peiyun, State Councilor; Professor Chen Minzhang, Minister of Health; and Vice-Governors and Secretary-Generals from 17 provinces. During the meeting, Professor Chen Minzhang, Minister of Health, clearly stated that all children should be immunized, regardless of order of birth and registered place of residence. Dr Omi led a WHO team to attend the meeting and presented the regional situation of polio eradication, as well as WHO’s recommendations on polio eradication of China. Many years later, he recalled, “this event can be considered as a very important turning point from the planning and preparation stage to the real implementation stage”.

Seventy-four million children aged under four years of age were given OPV in each round of the NIDs, a massive effort, not only in terms of numbers, but also
logistically, as vaccinators reached children all over the country, including many very remote settlements. It is said to have been the largest public health event in the history of the world up to that time, and only narrowly missed making the Guinness Book of World Records when India subsequently immunized a greater number in one of its polio NIDs.

JW Lee, Shigeru Omi and Alan Schnur of the original Polio Eradication Task Force at the Regional Office in Manila were in China for the great event, along with other international colleagues. On the evening of the first day they were gathered in Dr Omi’s hotel room to review the day’s events, when suddenly, to their surprise, President Jiang Zemin appeared on the television. He had been filmed that day giving OPV to children in Beijing. He had also inscribed a message of encouragement for parents, which was widely reproduced: “Express your love for children through immunizations.”

That gave a great boost to the polio eradication effort. Much publicity was given to the President’s involvement in the NIDs, and that encouraged greater participation by government leaders at all levels. The next day, the WHO visitors were met by provincial governors and higher officials than had previously been involved. The unexpected endorsement by President Jiang Zemin gave the Regional Office team strong reassurance that the polio eradication efforts in China would continue and would succeed. And once China, the giant of the Region, had shown it could be done, other countries would have to follow.

It was not until some time later that the WHO team found out how President Jiang had become involved in the NIDs. In such a huge country, the President could not be personally involved with every issue. Polio, although a serious disease, was not the most important cause of human suffering. As in many countries, the Ministries of Finance and Education tended to hold more sway than that of Health. Recognizing the importance of working with other groups, Ministry of Health staff had mobilized support from many sectors and groups, including an organization for the disabled, which had many members crippled by polio. Headed by the son of a former president of China, the group was quite influential and had a lot of experience in lobbying for its cause. Apparently, it had been able to inform President Jiang about the NIDs and convince him of the importance of the polio eradication effort as a way of preventing disease and disability.

China carried out further NIDs in the following two winters, and then went back to subnational immunization days, which were carried out in all provinces (although not simultaneously and not always provincewide) annually for the following four years.
As is often the case, looking back on things makes the picture much clearer; it is very hard to see the end of a chain of events while living through them. The last case of polio in China caused by indigenous wild poliovirus occurred in September 1994, between the first and second sets of NIDs. Since the second NIDs in December 1994 and January 1995, no indigenous wild poliovirus has been detected in China, despite intensive searching. It seems, therefore, that the first two sets of NIDs in China – building on the previous supplementary immunization work that had been carried out - eradicated wild poliovirus from almost a quarter of the world’s population (1.2 billion people) and a huge geographical area.

National immunization days spread throughout the Region

After China, the largest country in the Region and with arguably some of the most difficult conditions, had carried out its first successful round of NIDs in December 1993, many former sceptics began to believe that the remaining polio-endemic countries could also succeed in holding NIDs. Only the Philippines (April and May 1993) and Viet Nam (November 1993) had preceded China in holding NIDs. The Lao People’s Democratic Republic held its first round of NIDs the month after China’s, in January 1994. Mongolia followed in May of the same year. Cambodia began in February 1995, and Papua New Guinea in September 1997. Each country had prepared for its first NIDs by undertaking smaller-scale supplementary immunization activities (subnational immunization days or SNIDs), and had followed them with further rounds of supplementary immunization – either SNIDs or NIDs.

Each of the countries holding NIDs adapted the general strategy to its own requirements, and each was able to hold very successful, and progressively better, events. Countries shared their experiences through the forum of TAG meetings, while the regional institutions kept track of overall progress and provided technical advice and financial support. The multiple rounds of supplementary immunization in every recently polio-endemic country in the Region undoubtedly raised the level of immunity in the population, and contributed significantly to stamping out the wild poliovirus where it was circulating.