CONTROLLING
THE POLIO OUTBREAK IN CHINA

GLOBAL ERADICATION INITIATIVE

World Health Organization
Western Pacific Region
BACKGROUND

China had been free of polio for more than a decade when in July 2011 four children from Hotan Prefecture in the vast Xinjiang Uyghur Autonomous Region fell ill. Their symptoms of fever and paralysis suggested the return of the dreaded disease. The results of investigation and laboratory analyses in Xinjiang led to specimens being sent to Beijing for further confirmation. There, the national polio laboratory rang the alarm. This was wild poliovirus type 1.

China’s national preparedness plan for polio outbreaks immediately kicked in. On 25 August, the Ministry of Health called an emergency meeting to launch the response, coordinating and mobilizing all government and civil society resources. The next day, WHO received word of the outbreak and a request for assistance in determining the origin of the poliovirus. WHO was able to confirm that it was an imported strain that had crossed the border into Hotan from neighboring Pakistan, where the disease remains endemic.

There was great urgency to prevent the virus from spreading from Hotan to the rest of Xinjiang and, ultimately, to other parts of China or neighbouring countries. Several major population movements were set to happen over the following weeks: the end of summer holidays, with students and faculty returning to school, a major international event in Urumqi, Chinese National Day and the start of the cotton picking season. The outbreak was a ticking epidemiologic time bomb primed to explode.
Leadership at all levels

The direction for the outbreak response was set by 26 August. The leading group under Minister of Health Chen Zhu went to work in all aspects of coordination, technical matters and media communications and supported by the Chinese Center for Disease Control and Prevention (China CDC).

Members of the Ministry of Health met with officials in Xinjiang on 27 August and provided instructions. The Government of the Xinjiang Uyghur Autonomous Region convened a huge polio epidemic emergency response meeting on 30 August that was attended by concerned officials from throughout the region.

Over 1000 health workers had been trained in response immunization and surveillance by 31 August. By 2 September, more than 5 million doses of vaccines for the first round of immunization, along with the first group of more than 70 supporting polio experts, had been flown into the province. They were part of a public health army of more than 500 experts from around the country, brought in to support the more than 500 000 volunteers, health workers and government officials who were mobilized for the campaigns.

Finally, by 8 September, the first vaccination campaign was launched in Hotan, the epicentre of the outbreak, and over the next 5 days almost 4 million children were vaccinated with an initial dose of oral polio vaccine (OPV).

Motivated by the central Government in Beijing, local leaders took the campaign to heart and actively were involved in all aspects of the campaign. For every task and need, from transportation for the vaccination teams to the printing of posters, local officials were ready to help get things done quickly.
Altogether, 5 large-scale immunization campaigns were conducted in Xinjiang between September 2011 and April 2012. More than 43 million doses of OPV were administered to children and adults under 40 years old. Domestic vaccine manufacturers ensured sufficient amounts of qualified vaccines by immediately increasing their output and even producing a new vaccine (monovalent OPV) specifically targeting the imported poliovirus.

As the vaccines were manufactured outside Xinjiang they had to be refrigerated and airlifted directly into the outbreak area. They were then sent to the different sites however possible. The campaigns began in the warmth of summer, but the Chinese authorities ensured a highly effective cold chain, even devising rather clever ways to do so. At one vaccination post without a freezer temporarily stationed in an airport, the health workers made a deal with a local ice cream shop to keep their ice packs frozen.

The vaccine was always there, on time and in sufficient quantities. If a health post had more people than expected, a text message or call immediately would have somebody deliver more vaccines. To reach literally everybody, the campaigns went beyond conventional gathering places such as schools, health centres and community centres. One could drive through a city or town and every few metres there would be a desk with a big red banner heralding the vaccination campaign with vaccinators at the ready. There were vaccination posts at every bazaar and market. They would be set up at road checkpoints, at bus and train stations and even remote tourist sites.
IMMUNIZING CHILDREN

The vaccination campaigns for children kicked off in the schools and kindergartens. The teachers would have lists of all of the children enrolled and would note and double-check those who were absent. Every school, every kindergarten had it down to a well-organized routine. Each vaccinated child would receive an ear or finger mark with indelible ink, indicating they had received OPV. Children who were out of school could come in and get vaccinated at posts in community centres, health centres, at the homes of village leaders or other places where children could be found.

In the bazaars, there would be older boys who were helping relatives run their stalls while mothers would bring their younger children along while they shopped. At the animal market, one could see younger boys helping manage the livestock. So every bazaar and market would have vaccination teams ready to spot, catch and vaccinate every child without an ear or finger mark. For infants confined to homes, the teams would go house-to-house to check on and vaccinate the little ones. No effort was spared to offer every child the opportunity to be protected against polio.
VACCINATING ADULTS

When the first polio cases in adults were confirmed in early September, it was decided immediately to expand the vaccination campaign to older age groups. Getting adults vaccinated was a more critical and difficult phase in ending the outbreak. Adults are more mobile than children and thus are both much higher risks in spreading the virus and also much harder to track down. They may be less receptive to getting vaccinated, not taking the threat seriously or thinking that they are not vulnerable to it. They may be too busy to get to vaccination posts. All the adult polio cases up to that point were under 40 years old, so this determined the age range to be vaccinated.

China implemented two main strategies to reach as many adults as possible. Vaccination posts were, in addition to the regular sites, set up in any place that people frequented or passed through. Since many adults were on the move around this time, transportation was linked to vaccination, with posts set up at airports and bus and train stations. It often was not possible to travel without proof of vaccination, which was verified through vaccination cards and certificates. Teams also would check out gathering sites such as factories, farms and offices. They would even visit hotels at night when travellers had returned to their rooms. Comprehensive coordination was established with the operators and owners of all of these entities, who all gave strong support because a successful outbreak response was considered to be the responsibility of the entire society.
SPREADING THE WORD

It was impossible not to know about the polio vaccination activities in Xinjiang. The campaigns were ever-present in the media. Messages and information on the campaign would appear repeatedly on TV, radio and in the newspapers. Before every vaccination campaign, these messages also were sent out by the cellular phone networks operating in the region as texts to all of their subscribers. Information also was disseminated and made available in the local Uyghur language.

Social mobilization played a key role by involving the local political and religious leaders, community elders and volunteers to get the message out. In rural communities, artists would put on plays featuring traditional costumes, songs and dance. They would go from town to town and draw large crowds. The plays’ storylines were integrated with warnings about polio and the dangers of not being vaccinated. As an added incentive to pay attention, in between numbers there would be pop quizzes on polio and the vaccination campaigns, and whoever answered correctly would get prizes. To reach those staying home, local community leaders would go house-to-house and personally tell everybody about the campaign.

As soon as the outbreak had been confirmed, detailed information on the course of the outbreak and the response activities were posted on the websites of national and Xinjiang health authorities, newsletters issued and telephone hotlines established. Experts were invited to prepare and provide replies to frequently asked questions (FAQs).
CHECKING THAT NOBODY WAS MISSED

To monitor coverage, children were marked with indelible ink behind their ears or on their fingers to easily track whether they had been vaccinated. Adults were given a certificate verifying their vaccination status. Following a comprehensive coverage assessment plan, over 66,000 people were interviewed to ensure that they had received their vaccine. These surveys confirmed the efficiency of the campaigns.

To fully understand the scope of the outbreak, over 1000 health workers were trained quickly in surveillance requirements. A “zero” case daily reporting system was introduced to be on a constant watch for possible polio cases. Every hospital or health facility had to check their patients every day for suspected cases and report them. All hospital records since 2010, more than 200,000, were reviewed for suspect acute flaccid paralysis (AFP) cases, a condition that may also resemble polio. These were then reported and underwent a three-level screening process to rule out polio.

In places with identified polio cases, China and local CDCs would test stool specimens from everyone with whom the infected person had been in close contact. Stool samples also were taken from the general population and sewage samples were collected from the environment. Almost 2 million households were actively searched for additional suspected cases. At the same time, a new online real-time AFP surveillance system was rolled out across the country with computerized data entry at every hospital. In the face of these intensive efforts to screen for the virus, no new poliovirus infections have been reported in Xinjiang since the last detected case on 9 October 2011.
MOBILIZING SUPPORT FROM ALL OVER CHINA

Almost 500 experts from all over China were dispatched to Xinjiang to support each vaccination round as well as to strengthen the surveillance system. Every county in Xinjiang had at least one external expert to help them. The Ministry of Railways provided a train that carried a portable laboratory to Urumqi for field testing while the air force used its planes to transport the vaccines. In the rest of China, the largest preventive polio campaign in its history was under way. Other provinces also would conduct surveys and supplementary surveillance activities.

The Government of China allocated about US$ 55 million to the response effort, with resources provided by all levels of government. Not only were the necessary funds and technical support made available as needed, but government leaders embraced full responsibility and accountability and the minister and vice-minister of health visited Xinjiang nine times during the outbreak response.
The Chinese authorities were extremely receptive to adopting technical recommendations from their international partners. WHO was asked by the Government to help determine the origin of the virus and investigate the cause of the outbreak. At different stages, WHO also provided immediate technical input on critical decisions related to the outbreak response. WHO and the United Nations Children’s Fund (UNICEF) were invited to assess the quality and achievements of each vaccination campaign. UNICEF in particular supported the social mobilization activities.

To assess the impact of the outbreak response and determine the likelihood of continuing transmission, the Government welcomed an international team of experts from WHO and the United States of America Centers for Disease Control and Prevention (US CDC). The team was on the ground in Xinjiang and conducted a rigorous assessment of the surveillance sensitivity. Their conclusion in June 2012 was: “It is ‘highly unlikely’ that wild poliovirus continues undetected in the region”.

INVOLVING INTERNATIONAL PARTNERS
THE WAY FORWARD

A total of 21 polio cases, 10 children and 11 adults, were reported over the course of the outbreak, resulting in two deaths. The outcome could have been much worse if not for China’s rigorous response. The country succeeded in stopping the outbreak in record time, within just three months from index to last polio case. Most importantly, the response saved lives and prevented polio from spreading into other parts of China, a tremendously successful model by all measures.

Despite all precautions and interventions, however, the virus was still able to spread over a wide geographical area within the region. This proves that the aggressive outbreak response was warranted. China demonstrated a strong sense of responsibility to spare the international community from contagion. Exemplary intersectoral collaboration also was displayed by the various agencies involved.

To ensure that a similar situation does not recur, new strategies and capacities worked out during the outbreak will continue to be employed in routine immunization work. All laboratories in China have introduced new laboratory methods and upgraded their equipment so that in the future they can get faster results.

On 10 April 2012, China was removed from the list of countries with active polio outbreaks, hopefully for good. Its achievement is also a victory for the entire Western Pacific Region, which has thus maintained the polio-free certified status it had achieved in 2000. But the outbreak serves as a clear reminder of the dangers that polio continues to pose to children everywhere. Countries across the Western Pacific Region must therefore maintain vigilance to minimize the risks and consequences of potential re-infection. Until the disease has been eradicated from the remaining endemic areas of the world, this is the best insurance countries can undertake.
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