Poliomyelitis Outbreak Response Plan for Australia

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INTRODUCTION

Purpose of this Document

This response plan has been prepared for use in the event of an outbreak of a wild poliovirus (WPV) or vaccine derived poliovirus (VDPV) in Australia and outlines the routine surveillance procedures currently in place to detect potential poliovirus infections.

The Department of Health has prepared this document as a guide to roles and responsibilities for key organisations and agencies involved in disease surveillance and control. It is particularly aimed at those who are a part of Australia’s preparedness in addressing the potential public health, medico legal, social, community, political, trade and international relations impact of a case of poliomyelitis. It has been developed to provide a framework for containment activities required to manage the occurrence of either WPV or VDPV in Australia and is based on a risk management approach for biological emergencies, (1) that recognises that:

- such an event will occur infrequently;
- the evidence base for decision making may be limited and evolving; and
- community concern may be disproportionate to the level of risk.

In Australia the likelihood of locally acquired cases resulting from an importation of a WPV or VDPV is low due to high vaccination coverage and good sanitation. However, while WPV or VDPV continue to circulate globally there is the potential opportunity for outbreaks. Should local transmission occur the consequences would be profound so being prepared for an outbreak event is essential.

This outbreak response plan is guided by the World Health Organization's Global Polio Eradication Initiative. (2)
Potential Scenarios for a Poliomyelitis Outbreak in Australia

A single confirmed case of wild poliovirus or vaccine derived poliovirus infection is considered an outbreak.

There are several possible presentation scenarios for a poliomyelitis outbreak to occur in Australia as presented below. The most likely scenario is one in which an importation occurs from an endemic country such as occurred in 2007.\(^{(3)}\)

Scenario 1 - Importation of WPV from an endemic country or a country with recently imported poliovirus; or

Scenario 2 - Importation of VDPV from a country that has circulating VDPV; or

Scenario 3 - Acquisition of a poliovirus from a laboratory.

The presentation scenario will impact on the extent of the required health response. Any detection of poliovirus in Australia will require epidemiological investigation to determine the likely source of infection. A case of vaccine associated paralytic poliomyelitis (VAPP) from a country that is still using the oral polio vaccine (OPV) will need to be investigated, however, is not likely to result in secondary cases and therefore would not lead to activation of this plan. In contrast, a single confirmed case of WPV or VDPV infection, which while originating from the OPV strain has through prolonged replication re-acquired the neurovirulence and transmissibility of a WPV, is considered an outbreak and would activate this plan.
EMERGENCY RESPONSE TO AN OUTBREAK OF A WPV OR VDPV IN AUSTRALIA

Australia is free of indigenous poliovirus. Any outbreak of a WPV or VDPV is considered a public health emergency and would initiate activation of this response plan.

Key Components, Roles & Responsibilities

The national response plan is activated by the Chief Medical Officer (CMO) as Chair of the Australian Health Protection Principal Committee (AHPPC), in parallel with the reporting state or territory health authority, on notification of a confirmed or probable WPV or VDPV by the National Enterovirus Reference Laboratory (NERL). The CMO will also declare the end of the response. A brief flow chart of activities outlined in this plan is included in Appendix A.

The matrix for the investigation and response to a suspected case of poliomyelitis in Australia, including the roles and responsibilities for key response activities, is presented on pages 8-9. The matrix describes the likely diagnostic pathway and public health response and identifies key steps in the investigation of a suspected case of polio including factors critical for success. Actions are not intended to be strictly sequential; some will occur in parallel and the critical success factors may prove to be rate limiting steps.

The main response to a case of polio will be containment of potential spread, including:

- Isolation and testing of the index case;
- Risk assessment;
- Tracing and management of contacts;
- Targeted vaccination campaign;
- Education on infection control measures such as hand washing;
- Preventing ongoing community risk through environmental contamination; and
- Increased surveillance.

The critical factors affecting success of this containment will be:

- Timely recognition of acute flaccid paralysis (AFP) and reporting as part of active surveillance;
- Accurate and timely assessment of at risk population and environmental risk assessment;
- Identification of the source of infection;
- Detailed epidemiological data and case history to identify potential contacts and at risk populations;
- Uptake of vaccine by at risk populations; and
- Active surveillance.

All virology laboratories in the jurisdiction will need to be alerted to the potential for poliovirus to be isolated. It will be necessary to take stool specimens from close contacts of the index case. All clinicians will need to participate in intensified surveillance for AFP and hospital records may need to be checked for potential additional AFP cases.
Emergency Response Team

The public health response to a confirmed case of polio will be coordinated by the Communicable Diseases Network Australia (CDNA) with support from the Commonwealth. Any diagnosis of polio in Australia will be of international significance, so it will be imperative to ensure a nationally consistent approach to the release of information and an effective national response, as well as international reporting through the WHO International Health Regulations (IHR) Focal Point.

A confirmed case of poliomyelitis is considered a public health emergency. Cases that cannot be confirmed due to the absence of virological evidence but are considered clinically as polio-compatible (i.e. meet the national case definition for a probable case) would also initiate response under this plan. Response teams will be required at different levels of the public health system; certainly state or territory and national level teams will be required to work closely together. The primary response will be driven at the state or territory level with overarching coordination at a national level by the National Incident Room as required. An epidemiologist from the state or territory health department and a representative from the NERL would be included in the response team. Technical advice may be sought from Polio Expert Panel (PEP), the National Certification Committee for the Eradication of Poliomyelitis (NCC) and the Australian Technical Advisory Group on Immunisation (ATAGI) as required. Key stakeholders are listed under Appendix B.

Notification to the WHO IHR Focal Point

All confirmed cases of polio must be reported to the WHO as per the decision tree algorithm contained in Annex 2 of the WHO International Health Regulations (2005). Notification by the relevant state or territory health department occurs through the National Focal Point, based in the Office of Health Protection, Department of Health, to the WHO IHR Focal Point. In the event a case cannot be laboratory confirmed but is considered probable, reporting to the WHO, though not required, is desirable and would follow the same process.
**EPIDEMIOLOGICAL INVESTIGATION OF POLIOVIRUS INFECTION**

The response team should review the patient records and ensure that the following information has been collected for the index case:

- Age of patient, date of onset of paralysis;
- Residence or travel to a polio endemic country, or one with active transmission following an importation, or VDPV is circulating, or a country that uses OPV;
- Vaccination status, including timeframes and the vaccine used (OPV or inactivated polio vaccine, IPV);
- Contact with persons recently immunised with OPV or persons who have recently travelled to a polio endemic country, or one with active transmission following an importation or VDPV is circulating, or a country that uses OPV;
- Potential for further spread noting that health care workers and people who have contact with children, or are involved in food preparation have a greater chance of spreading infection to a larger number of people;
- Potential for exposure to laboratory strains of poliovirus;
- Immune status of patient and contacts; and
- Indigenous status.

The epidemiological investigation and collection of stool specimens may involve the local community, including childcare facilities, schools and other community groups.

The epidemiological investigation aims to establish where the infection was acquired and where it may have spread. If the initial infected patient does not have a travel history that indicates they have acquired the infection overseas, or potential for laboratory exposure, the epidemiological investigation becomes extremely urgent to establish where the infection was acquired and to inform public health containment strategies. The short incubation period and ability for asymptomatic patients to shed poliovirus may mean that many individuals are exposed to the virus before a case of AFP is detected.

Laboratory testing of stool specimens is required to confirm poliovirus infection and to determine whether a poliovirus is a wild or vaccine strain. All WPV and VDPV isolations would necessitate an immediate public health response. The response to isolation of a vaccine strain of poliovirus may vary according to the perceived risk for further person to person transmission. Isolation of a VDPV would be considered a high risk and should be treated the same as for isolation of a WPV, while the response to isolation of an OPV strain would be consistent with the reality that secondary cases are unlikely. Since more specific laboratory tests are needed to differentiate a VDPV from an OPV strain of poliovirus, the initial public health response should assume isolation of a VDPV until laboratory results indicate otherwise.
# Matrix for the Investigation and Response to a Suspected Case of Poliomyelitis in Australia

<table>
<thead>
<tr>
<th>Action</th>
<th>By whom</th>
<th>What &amp; how</th>
<th>When</th>
<th>Critical success factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case of AFP</td>
<td>Paediatricians, Neurologists, Other clinicians</td>
<td>Clinical presentation of AFP.</td>
<td>Presentation at health care facility.</td>
<td>Inclusion of poliovirus infection in the differential diagnosis of AFP.</td>
</tr>
<tr>
<td>Reporting to NERL, local public health unit and APSU/PAEDS (for paediatric cases)</td>
<td>As above</td>
<td>Phone call to NERL and local PHU. (return of APSU report card and AFP questionnaire; ascertainment of case by PAEDS)</td>
<td>As soon as AFP is considered in the differential diagnosis (where polio is not excluded).</td>
<td>Notification of paediatric case via APSU/PAEDS, Immediate notification to NERL, Adequate stool specimen collection for diagnostic testing at the NERL</td>
</tr>
</tbody>
</table>
| Notification of a suspected case to the relevant jurisdictional and Commonwealth health authorities | Via a local public health unit OR NERL OR clinicians directly | - Notification of a suspected case and the expected time to confirm the diagnosis.  
- Initiation of case investigation protocol. | Should occur as soon as possible after clinician referral and ideally within 24 hours. | Agreed referral protocols. |
| Confirm the diagnosis                                       | NERL in collaboration with clinicians        | Diagnosis confirmed on the basis of clinical and laboratory findings. | When stool specimens are available.        | - Availability of stool specimens.  
- Collection of 2 stool specimens within 14 days of onset of symptoms and at least 24 hours apart.  
- Availability of clinical findings. |
<p>| Identification of WPV or VDPV                               | NERL                                         | Poliovirus typing by virus culture, RT-PCR and genetic sequencing. | Either direct on stool specimen or after virus culture, which will require days. | Timely referral of adequate specimens for testing by the NERL. |
| Refer case to PEP                                           | NERL/APSU/PAEDS OR Relevant Department of Health through CDNA | Arrange special teleconference of PEP including the chair of NCC to discuss case and joint teleconference with CDNA to follow if polio is considered. | When polio is considered in the differential diagnosis. | Adequate clinical and laboratory data provided by NERL (and APSU/PAEDS) for consideration by PEP. |
| Activation of jurisdictional responsibilities under this response plan | State or territory health authority          | Activate response plan, including all steps from here down. | As soon as WPV or VDPV infection is confirmed by the NERL or considered probable by PEP. | Timely reporting of poliovirus typing results by the NERL. |
| Epidemiological investigation and risk assessment for local spread | CDNA in collaboration with NERL, Commonwealth and State or Territory CHO | Detailed case investigation to trace contacts and presentation scenario. Also review of immunisation status and environmental risks of contact community. | Immediately after notification of a suspected case of polio. | As above AND Availability of credible exposure history. |</p>
<table>
<thead>
<tr>
<th><strong>Action</strong></th>
<th><strong>By whom</strong></th>
<th><strong>What &amp; how</strong></th>
<th><strong>When</strong></th>
<th><strong>Critical success factors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Polio Outbreak Response Plan officially activated</td>
<td>CMO via AHPPC/CDNA</td>
<td>- Information link to relevant Australian Government Ministers and WHO Focal Point. - Australian Government/State/Territory coordination &amp; links to experts. - Activate communication strategy.</td>
<td>As soon as possible after initial epidemiological investigation identifies risk, or when the case becomes a probable or confirmed case of polio.</td>
<td>Strength of evidence supporting diagnosis of polio AND/OR Media interaction or response to public speculation.</td>
</tr>
<tr>
<td>Containment</td>
<td>State or Territory health service</td>
<td>- Isolate infected patients. - Targeted vaccination campaign. - Increased surveillance. - Management of contacts and collection of stool specimens for testing at the NERL. - Environmental and sanitation measures as appropriate.</td>
<td>As soon as polio is confirmed.</td>
<td>- Uptake of vaccine. - Detailed investigation of potential contacts including collection of stool specimens from close contacts. - Thorough risk assessment for environmental contamination.</td>
</tr>
<tr>
<td>Patient support and family services</td>
<td>State or Territory and Australian Government. Carer organisations</td>
<td>Examination of the availability, efficiency, effectiveness and acceptability of support services by family/carers/hospitals etc.</td>
<td>As soon as diagnosis is suspected or confirmed.</td>
<td>Individual access to support services.</td>
</tr>
<tr>
<td>Risk communication</td>
<td>CMO in collaboration with jurisdictional CHO, AHPPC/CDNA and other relevant agencies depending on the facts of the case</td>
<td>- Detailed communication strategy developed in collaboration with Department of Health media unit. - Notification to the WHO Focal Point under the International Health Regulations. - Reporting of laboratory results to WHO by NERL.</td>
<td>- Management of media interactions at any stage of the investigation. - Notify the WHO Focal Point when diagnosis confirmed.</td>
<td>- Timing and nature of media releases depends on the scenario encountered and whether there is an ongoing risk to the Australian community. - Timing of international notification dependent on confidentiality being maintained by those involved in diagnosis &amp; case investigation.</td>
</tr>
<tr>
<td>Debriefing and review of the polio response plan</td>
<td>Teams at local, jurisdictional and national levels including a representative from NCC</td>
<td>- Identify strengths and weaknesses of response plans, including coordination. - Economic evaluation. - Applied research arising out the investigation as appropriate.</td>
<td>As required.</td>
<td>- Agency/partner participation. - Review findings incorporated where relevant into polio response plan and communicated to relevant stakeholders including the WPR RCC.</td>
</tr>
</tbody>
</table>
Activation of Laboratory Surge Plan

Based on the experience of the 2007 importation, the number of specimens to be tested from contacts of the index case can quickly increase. Nucleic acid based tests (reverse transcription polymerase chain reaction, RT-PCR) are more amenable to high throughput testing than virus culture and after the 2007 importation the NERL implemented pan-enterovirus RT-PCR testing of all specimens from AFP cases in parallel to the WHO recommended culture based procedure.

In the event of another polio importation, the NERL would be in the position to provide public health authorities with rapid RT-PCR test results. In consultation with key stakeholders, the public health response could be based on the NERL’s RT-PCR testing of patient specimens with the timing of confirmatory virus culture dependent on the number of cases involved.

Risk Assessment

A risk assessment should be conducted by the relevant state or territory health authority and ideally completed within 72 hours of confirmation of a case, to identify the following:

- The immunity profile of the population;
- Any areas of suboptimal vaccination coverage;
- Any subpopulations at high risk; and
- Environmental risks that would heighten concern for transmission.

Containment strategies

The containment of a potential outbreak of poliovirus will include the following:

- Isolation of infected individuals;
- Tracing and management of potential contacts;
- Cleaning and disinfection and infection control (including environmental factors);
- Immunisation; and
- Education and increased surveillance.

Isolation of infected individuals

Individuals identified as being infected with poliovirus should be isolated to minimise potential for spread. Contact precautions should be implemented and, if hospitalised, the patient should have a single ensuite room. A stool specimen should be collected weekly for testing at the NERL. Isolation should continue until two stool samples taken seven days apart are shown to be negative for poliovirus. Poliovirus infection is usually cleared within six weeks by an immunocompetent person but may become chronic in immunocompromised individuals immunised with OPV that may result in an immunodeficient VDPV (iVDPV). Stool samples should be taken monthly in immunocompromised individuals until two consecutive stool samples are shown to be negative for poliovirus. Persons identified with a chronic poliovirus infection should be
counselled regarding good hygiene practices and consideration given to whether a sanitary assessment of their living conditions is necessary.

Families and carers of a patient with polio should observe good sanitation and hand washing. All health care workers, carers and family should be adequately immunised against polio (see Tracing and management of potential contacts below). As most cases of AFP require hospitalisation, health care workers should refer to the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010)\(^5\) for the correct infection control procedures.

**Tracing and management of potential contacts**

In order to contain the spread of poliovirus, which produces a large number of asymptomatic infections, contact tracing undertaken by the relevant jurisdiction(s) is important to identify potentially infected individuals. There are four major categories of people who may have had contact with the index patient and therefore may have been exposed to the poliovirus:

- Household contacts (people who lived with the index patient and shared a toilet during the infectious period). These people represent the greatest risk as they may have had contact with the index patient prior to the appearance of symptoms.
- Toilet contacts (people who shared a toilet with the index patient during the infectious period, before the toilet was cleaned).
- Health care workers (people who cared for the index patient during the infectious period) and laboratory workers involved with testing the patient's specimens. It will be necessary to ensure that appropriate procedures should be followed by laboratory workers during testing of suspect samples.
- Public contacts, including consumers, in the event that the case prepared food for others to eat.

Previous vaccination or exposure to poliovirus does not necessarily prevent infection and most people are infected with poliovirus without showing symptoms. As such, the following precautions are advised to prevent further transmission of potentially infected contacts.
Management of infected individuals and potentially infected contacts

<table>
<thead>
<tr>
<th>Individual or contact</th>
<th>Management action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected individuals</td>
<td>Isolate in hospital and use contact precautions. A stool specimen should be collected weekly for testing at the NERL. Isolation should continue until two stool samples taken 7 days apart are shown to be negative for poliovirus.</td>
</tr>
<tr>
<td>Household contacts (people who lived with the index patient and shared a toilet during the infectious period)</td>
<td>Quarantine household contacts at home. Take stool samples &gt; 3 days after the contact’s first exposure to the index patient. Contacts can be released from quarantine when two stool samples taken 24 to 48 hours apart are shown to be negative for poliovirus. Take a baseline serum sample prior to vaccination with a booster dose of IPV, or if vaccination status is unknown, offer a full course of IPV.</td>
</tr>
<tr>
<td>Toilet contacts (people who shared a toilet with the index patient during the infectious period, before the toilet was cleaned)</td>
<td>Offer education on hygiene and vaccination. Offer vaccination with IPV. Assume Australian-born contacts have been vaccinated and offer a booster; assume overseas-born may not have been fully vaccinated and offer a full course of IPV.</td>
</tr>
<tr>
<td>Health care workers (people who cared for the index patient during the infectious period) and laboratory workers involved with testing the patient’s specimens</td>
<td>Offer a booster vaccination with IPV for anyone who has not had a booster within the previous 10 years. For health care workers in close contact with the index patient who have no recorded immunisation history, or are not completely vaccinated, take two stool samples, 24 to 48 hours apart, with the first being taken &gt; 3 days after the contact’s first exposure to the index patient and offer a full course of vaccination with IPV (three doses a minimum of one month apart).</td>
</tr>
<tr>
<td>Public contacts (including consumers, in the event that the case prepares food for others to eat)</td>
<td>Offer education on hygiene and vaccination. Offer vaccination with IPV. Assume Australian-born contacts have been vaccinated and offer a booster; assume overseas-born may not have been fully vaccinated and offer a full course of IPV. A global stockpile of type specific monovalent OPV (mOPV) is being held by the WHO. Depending on the specific epidemiological circumstances and in negotiation with WHO Western Pacific Region (WPRO), mOPV may be considered in a local outbreak response.</td>
</tr>
</tbody>
</table>
Poliomyelitis Outbreak Response Plan for Australia

Summary information pertaining to the household transmission of polioviruses and non-polio enteroviruses can be found in Fields Virology 6th Edition(6) which states that: “Household secondary attack rates in susceptible members may be greatest for the agents of acute hemorrhagic conjunctivitis (enterovirus type 70 and coxsackievirus A24 variant) and for poliovirus, and of lesser magnitude for the coxsackieviruses and echoviruses. In some studies, secondary attack rates may be 90% or greater, although they are typically lower. New York Virus Watch(7) data indicate that enterovirus infections were more frequent among children 2 to 9 years of age and the greater spread of polioviruses and coxsackieviruses may derive from longer periods of virus excretion.”

Tracing of toilet contacts (such as those sharing a section of an aeroplane, workplace or childcare centre with the infected patient) is important to reduce the risk of onward transmission of infection. For containment, the tracing of contacts needs to be more rapid than the spread of the virus. One of the most important reasons for tracing of contacts is to educate them on hygiene and vaccination.

Contact tracing may not prevent a contact becoming infected with poliovirus, particularly if they are not adequately immunised, but stool sampling of household and incompletely vaccinated health care worker contacts (as outlined in the table above) and increased surveillance for clinical symptoms such as AFP will identify spread of the virus and allow prevention of further transmission.

In addition to stool samples, blood specimens may be collected from household contacts of the index case for polio antibody testing prior to immunisation with IPV. Vaccination should not be delayed whilst waiting for a result to the antibody test.

Targeted tracing and immunisation of contacts such as health care workers, food handlers and child care workers, who have the potential to spread infection to a large number of people, should be prioritised.(8) The Department of Immigration and Border Protection will be involved in identification of contacts in a diplomatic or refugee setting. The Department of Defence may become involved in identification of contacts should a defence member or dependant be exposed to poliovirus in the course of their duty.

Cleaning and disinfection

Proper cleaning and disinfection of areas contacted by an infected individual is required to prevent onward transmission. Following the imported case in Australia in 2007, cleaning and disinfection of the aeroplane and airport toilets, as well as the patient’s home was performed. No evidence of transmission of polio on aeroplanes has been reported.

Survival of poliovirus is favoured by lower temperatures and high moisture content. Once excreted, the virus can survive outside the human body for weeks at room temperature.(9) Laboratory studies have shown that poliovirus survival in the environment is enhanced at high relative humidity.(10) Typical relative humidity for aircraft is below 10% suggesting the virus may not survive for long periods in this environment.(11) Interpolating data from various studies, Dowdle and Birmingham estimated poliovirus infectivity to decrease by 90% every 20 days in winter and 1.5 days in summer, in sewage every 26 days at 23°C, in fresh water every 5.5 days at ambient temperatures, and in seawater every 2.5 days under the same conditions’.(12) Poliovirus
survived on cotton fabric with minimal loss for 24-48 hours at ambient temperature and 35% relative humidity, with rapid loss after 48 hours. Poliovirus survived longer on woollen fabrics with recovery after 20 weeks at the same humidity.\(^{(13)}\)

Active disinfection procedures should involve the use of cleaning practices to remove soiling that may harbour and protect viral particles. Common disinfectants such as 70% ethanol, isopropanol, lysol and quaternary ammonium compounds are not effective against poliovirus.\(^{(6)}\) The virus is also resistant to lipid solvents (such as EcoTru\textsuperscript{®} and Dettol\textsuperscript{®}) and is stable in many detergents at room temperature, although temperatures above 60°C for prolonged periods will reduced the infective capability of poliovirus.

Effective disinfectants are those which contain free chlorine, such as sodium hypochlorite or bleach, glutaraldehyde solutions, formaldehyde solutions and iodophores.\(^{(6)}\) Contact time is also important in inactivating the virus. Laundry should be soaked in chlorine bleach (diluted according to the manufacturer’s instructions) for at least 15 minutes.

The WHO Guide to Hygiene and Sanitation in Aviation,\(^{(14)}\) provides indicators and guidance notes for post-event disinfection procedures to assist airport and aircraft operators in the prevention of the spread of disease.

**Faecal matter management**

A risk assessment for the shedding of WPV and VDPV from potentially infected individuals should be undertaken. The index case of a WPV importation or person infected with a VDPV would be isolated in hospital until virus shedding ceased. This is likely to be in a major hospital with sound infrastructure. While close contacts were being tested for secondary cases, the ramification of potentially shedding WPV or VDPV into the local sewerage network should be reviewed. A reticulated sewerage system in a major urban setting may be deemed safe from a public health perspective but an older network in a regional or remote area may present additional risks.

The variable condition of septic tanks may also be considered a potential public health threat if a WPV or VDPV infection was subsequently identified in a contact that had used this system.

Where the potential risk of poliovirus transmission by environmental sources was determined to be high, preventative strategies such as the installation of a sewage trap should be investigated. As a further assessment of poliovirus being shed within the sewerage network, grab samples can be taken from a septic tank or at strategic points of a reticulated system and tested by the NERL.

**Immunisation**

There is no published evidence on the role of polio vaccination as post-exposure prophylaxis against paralytic disease. Theoretically, as IPV induces IgG immunity in some people after a single dose, IPV provided during the incubation period to paralytic disease could protect the individual. However, it is more likely that the high immunisation rate in Australia and an individual’s previous immunisation will prevent further transmission throughout the community and paralysis in infected contacts. At present, immunisation with IPV in contacts and health care workers without a known immunisation history of
receiving at least three doses of an appropriate poliovirus vaccine (e.g. IPV or OPV), or with incomplete immunisation history, is recommended in order to ensure that all possible harm minimisation measures are implemented. Because there is an absence of evidence on the protective role of IPV vaccination after possible exposure, contacts vaccinated need to be informed that they are not necessarily protected by vaccination and that they should still contact their state or territory health authority if they develop any of the symptoms outlined on a supplied fact sheet. Individuals offered immunisation should be reassured that IPV is not a live vaccine and will not cause polio infection. The state or territory health authority coordinating the response will decide the need for vaccinations of contacts depending on the time elapsed from their exposure to the infected individual.

IPV is the only polio vaccine readily accessible in Australia and is available in either a single vaccine formulation or in combination with other vaccines. The National Immunisation Programme recommendations for the polio vaccination schedule, including information regarding contraindications for use of the vaccines, are outlined in the Australian Immunisation Handbook (10th Ed 2013). IPV will be administered to unvaccinated contacts, as above, whilst a full containment response is developed. The extent of the immunisation response will to some degree depend on the scenario by which poliovirus infection occurs. For example a laboratory exposure to poliovirus may only require vaccination of known contacts, whereas an importation of poliovirus in a person who has travelled to Australia via aeroplane may require a more widespread vaccination and containment response and community involvement in surveillance for symptoms of poliomyelitis. Although the national immunisation rate for polio is very high, there are pockets of unvaccinated individuals within which transmission will be possible. Large vaccination or re-vaccination campaigns may need to be implemented, depending on the time that has elapsed since the onset of paralysis in the index case and the population involved.

A global stockpile of type specific monovalent OPV (mOPV) is being held by the WHO. Depending on the specific epidemiological circumstances and in negotiation with WPRO, mOPV may be considered in a local outbreak response. The Therapeutic Goods Administration would need to regulate special import of these monovalent vaccines for use in an outbreak situation through the Special Access Scheme.

The NERL tests for polio antibodies in cases with a clinical suspicion of poliomyelitis. The test detects total immunoglobulin virus neutralizing antibodies and does not distinguish between vaccine and wild strains of poliovirus. A blood specimen should be collected prior to immunisation if testing for polio antibodies is required.

Education and increased surveillance

As part of the containment strategy, education will be essential as poliovirus infection is a very rare occurrence in Australia. Health care workers need to be educated on appropriate contact precautions, testing and immunisation. Cleaning staff will need to be educated on appropriate cleaning agents and contact times. Potential contacts need to be educated on testing and immunisation and symptoms of which they should be aware. In order to ensure that any further transmission is detected, clinicians and testing laboratories need to ensure that all cases of AFP have appropriate stool sampling and are referred to NERL for testing. Australia’s freedom from poliovirus infection can only be
demonstrated by maintaining the WHO performance indicators for AFP surveillance, including appropriate stool sampling.

**Environmental Surveillance**

Individuals excrete poliovirus for several weeks after infection and, as noted in the section on Cleaning and Disinfection, it is estimated that poliovirus can survive in sewage with a 90% loss of infectivity every 26 days at 23°C. WHO estimates the theoretical maximum sample sensitivity of environmental surveillance at detection of one individual infected with poliovirus among 10,000 uninfected individuals.

Environmental surveillance has played an important role in the certification of endemic countries, such as Egypt (the last isolation of indigenous WPV was from an environmental sample) and India as polio-free, many established polio-free countries have also used this system to supplement their existing surveillance systems. Australia has performed routine testing of environmental samples for poliovirus at sentinel sites since 2009. Grab samples of sewage are collected at the inlet to wastewater plants prior to treatment and referred to the NERL for processing overnight. While no polioviruses have been isolated, non-polio enteroviruses were reported as indicator organisms for the validation of the collection, transport and processing of the samples.

Any poliovirus picked up by routine environmental monitoring would be cause for further investigation. The response could entail alerting physicians, performing enhanced surveillance for AFP cases for 6 months, continuing to sample sewage at the same site for 6 months, ensure all enterovirus isolations from cases of aseptic meningitis were typed and to assess vaccine coverage for gaps, especially in at risk groups.

Confirmation of a polio outbreak would require one of the following conditions to be met: multiple detection of WPVs or VDPV in the environment; detection of a number of genetically distinguishable WPVs or VDPV; and cases of paralytic polio or isolation of WPVs or VDPV from infected persons.

**Enterovirus Surveillance**

The clinical manifestation of poliovirus infection ranges from febrile illness to meningitis and paralysis. As part of extended surveillance for poliovirus, the NERL established the Enterovirus Reference Laboratory Network of Australia (ERLNA) in 2009, consisting of public diagnostic virology laboratories. The member laboratories either type enteroviruses detected in clinical specimens or refer them to the NERL for identification. This serves the dual purpose of confirming or excluding the presence of poliovirus as well as surveying the epidemiology of non-polio enterovirus infection in Australia. WPV or VDPV detected by this form of surveillance would require follow-up by the state or territory health authority according to the investigation matrix. As part of an investigation of a confirmed WPV or VDPV importation, the ERLNA may provide recent enterovirus typing results, particularly from meningitis cases, and follow-up on any untyped results from the jurisdiction involved.

Even though Australia ceased use of OPV from November 2005, Sabin poliovirus strains can be detected in clinical specimens from persons who either travelled to a country routinely using OPV, or were in contact with someone who had done so. Two incidental
detections of Sabin-like poliovirus have been reported through the ERLNA. The first occurred in 2009, when an unimmunized infant was hospitalized for failure to thrive and a Sabin poliovirus was identified during the clinical investigation. The infant’s family had not recently travelled outside of Australia and the source of the virus was not determined. The second occurrence was in 2013, when an infant was immunized with OPV while overseas and a Sabin poliovirus was detected when the infant was hospitalized for other reasons upon return to Australia.

**Communication Strategy**

One of the most important elements of a public health response will be the communication strategy to ensure that accurate information is provided to the media and the community, as release of inaccurate or premature information may have serious repercussions for the affected individual, their family, carers and their community. The media may also be important in education of the public on the importance of sanitation, hand washing and immunisation in the containment phase.

It is important that the media are presented with up to date and factual information in order to minimise speculation and public concern. It is important for key stakeholders to have agreed on a national notification and communication strategy. The CDNA will formulate the key messages and the Commonwealth will coordinate the media response. The Department of Health’s website will have current information and media releases.

For media inquiries, please contact:

Media Unit Australian Government Department of Health

Phone: (02) 6289 7400

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**SURVEILLANCE OF AFP AND POLIOMYELITIS IN AUSTRALIA**

**Australian Poliovirus Surveillance Program**

The Australian Government funds the Australian Poliovirus Surveillance Program to conduct surveillance for poliovirus in Australia in order to detect imported cases, mitigate the risk of localised transmission should importation occur and provide ongoing evidence that Australia is maintaining its polio-free status in accordance with WHO recommended standards. The objective of this program is to conduct clinical surveillance for AFP in children less than 15 years of age, and in anyone in which poliomyelitis is suspected, in accordance with WHO standards for a polio free country. Clinical surveillance is supplemented by virological surveillance including enterovirus and sentinel environmental surveillance activities. The clinical and virological surveillance activities monitor Australia’s polio-free status and provide ongoing evidence that the country is free of circulating WPV in support of the global eradication effort.

The maintenance of a surveillance system that is sensitive enough to detect a case of polio in Australia is essential, particularly as clinicians will rarely have experience in diagnosis of polio. Although, in the context of good sanitation and high immunisation rates, AFP is unlikely to be polio related, active surveillance is vital to detect cases.

To ensure the detection of a case of poliomyelitis further clinical, epidemiological and laboratory investigation is required in the following situations.

1) **All AFP cases in children less than 15 years of age to exclude poliomyelitis.**

The WHO has set a performance indicator for AFP surveillance in children. In a polio non-endemic country, such as Australia, the performance indicator is one case of non-polio AFP per 100,000 children aged less than 15 years of age, which equated to 43 cases in 2014. If insufficient cases of AFP are reported, the surveillance system is deemed not sensitive enough to detect a potential case of poliomyelitis. The differential diagnosis of an AFP case upon initial presentation may include poliomyelitis, Guillain-Barré syndrome and transverse myelitis. If reporting of AFP is delayed to exclude other causes, or if a case of AFP is not reported and no follow up laboratory investigation occurs, it is possible that a case of AFP due to poliovirus infection could be missed. Failure to report AFP, a lack of stool specimens or insufficient information in clinical questionnaires can result in Australia not reaching the expected annual number of AFP cases or having an adequate number of stools for virological investigation.

It is important to report all cases of AFP in children, even those that are later found to exclude poliovirus infection based on clinical and laboratory investigation. AFP surveillance was initiated in March 1995 as part of Australia’s commitment to the Global Polio Eradication Initiative. Active surveillance for AFP is conducted through the Australian Paediatric Surveillance Unit (APSU) via participating Paediatricians and the Paediatric Active Enhanced Disease Surveillance (PAEDS) system through 5 tertiary paediatric hospitals across Australia in collaboration with the WHO accredited NERL located at the Victorian Infectious Diseases Reference Laboratory (VIDRL). The active surveillance system coordinated by the APSU and VIDRL also regularly provides data to
the WHO regional office to assess the surveillance system against the performance indicators for AFP reporting.

2) All suspected cases of paralytic poliomyelitis regardless of age.

It is imperative that any case with a clinical suspicion of poliomyelitis in a person of any age be fully investigated.

3) All suspected cases of non-paralytic poliovirus infection regardless of age.

It is estimated that 90% of poliovirus infections are asymptomatic. This includes close contacts of confirmed polio cases, immunocompromised individuals from whom a poliovirus was isolated and laboratory derived infections.

Clinical Reporting of AFP

AFP surveillance in Australia follows the WHO criteria targeting children less than 15 years of age. The scheme requires clinicians to report and submit stool samples from any case of AFP in one or more limbs or acute onset of bulbar paralysis, even where poliovirus infection is considered a highly unlikely clinical diagnosis. The case definition for poliovirus infection, which includes a definition for AFP as part of the clinical evidence, is provided at Appendix C. The procedure and Laboratory Request Form for referring stool specimens to the NERL is available at Appendix D.

The procedures to be followed by clinicians in (1) all cases of AFP in children and (2) in suspected cases of poliomyelitis in a person of any age are outlined below and a flow chart is available in Appendix E.

If poliomyelitis is suspected or if poliovirus is isolated, the case should be immediately notified to the state or territory health authority and steps taken to confirm the diagnosis. Key contact details for state and territory health authorities are included in Appendix F.

The adequate collection of stool specimens is the responsibility of clinicians and is essential for confirmation of poliovirus infection. Collection of adequate patient history by clinicians allows for a more accurate assessment of the risks to contacts. It is essential to collect as much information as possible about the patient's history and risks of exposure to WPV or OPV, including VDPV. Including:

- Age of patient, date of onset of paralysis;
- Residence or travel to a polio endemic country or a country that has recently reported poliovirus outbreaks or VDPV or uses OPV;
- Vaccination status, including timeframes and the vaccine used (OPV or IPV);
- Contact with persons recently immunised with OPV or persons who have recently travelled to a polio endemic country, or a country that has recently reported outbreak of polio cases or VDPV, or a country that uses OPV;
- Potential for exposure to laboratory strains of poliovirus;
- Immune status of patient and contacts; and
- Indigenous status.
Such information is critical when attempting to trace potential sources of infection both forward and back.

**Laboratory Confirmation of Poliomyelitis in Australia**

Confirmation or exclusion of poliovirus infection is not possible without laboratory testing of stool specimens so it is important that stool specimens are collected from every case of AFP in children and cases with a clinical suspicion of poliomyelitis in persons of any age. Stool specimens from close contacts of confirmed polio cases should also be tested for poliovirus. The isolation of a poliovirus from a specimen of an asymptomatic person would be regarded as a poliovirus infection that did not cause paralysis. Definitive diagnosis will establish the need for follow up actions to contain and prevent spread of a WPV or VDPV. As poliovirus can spread very quickly, rapid detection of cases is critical. Under WHO guidelines, stool specimens must be tested in a WHO accredited laboratory, which for Australia is the NERL at VIDRL.

WHO recommends that all stool specimens from AFP cases be tested by virus culture using the RD-A and L20B continuous mammalian cell lines. The NERL also routinely screens stool specimens from AFP cases with a pan-enterovirus RT-PCR and identifies the enterovirus type by sequencing a fragment of the VP1 genomic region. While virus culture has the advantage of increasing the virus titre present in an extract of the original clinical specimen, the procedure can be laborious requiring at least one passage to a fresh monolayer of cells. The reporting of a negative result can take up to 14 days, which is not timely in the context of an outbreak investigation. The index case from the 2007 polio importation was held in isolation for 34 days and the household contacts under home quarantine for 16 days before the assigned criteria were met to issue negative virus culture results of stool specimens.

Serological testing for total polio immunoglobulin may be helpful in supporting or ruling out the diagnosis of poliomyelitis. An acute serum specimen should be obtained as early in the course of disease as feasible, and a convalescent specimen should be obtained 3 weeks later. A fourfold or greater rise in titre, or a change from seronegative to seropositive between the acute and convalescent specimens suggests poliovirus infection. Non-detectable antibody titres in both specimens may help rule-out poliomyelitis, but may be falsely negative in immunocompromised persons, who are also at highest risk for paralytic poliomyelitis. In addition, neutralising antibodies appear early and may be at high levels by the time the patient is hospitalized; thus, a four-fold rise may not be demonstrated. One of the limitations of serology is the inability to distinguish between antibody induced by OPV strains and antibody induced by WPV.

The cerebrospinal fluid usually contains an increased number of leukocytes, from 10 to 200 cells/mm³ (primarily lymphocytes) and a mildly elevated protein from 40 to 50 mg/100 ml. This finding is non-specific and may result from a variety of infectious and non-infectious conditions and is therefore not useful for routine diagnostic purposes.

**National Notification of Poliomyelitis**

All Australian states and territories have public health legislation that requires medical practitioners and/or pathology laboratories to notify the occurrence of specific communicable diseases to their respective health departments. In September 2007, the
National Health Security Act 2007 (National Health Security Act 2007, No. 174, 2007) received royal assent. This Act provides a legislative basis for and authorises the exchange of health information, including personal information, between Australian jurisdictions and the Commonwealth. The Act provides for the establishment of a National Notifiable Diseases List which specifies the diseases about which personal information can be provided. De-identified data on these diseases are reported to the Australian Government Department of Health’s National Notifiable Diseases Surveillance System (NNDSS). The National Health Security Agreement, signed by Health Ministers in April 2008, establishes operational arrangements to formalise and enhance existing surveillance and reporting systems, an important objective of the Act.

Nationally, cases are collated by the NNDSS under the auspices of the CDNA. The relationship between the state and territory health authorities and the Commonwealth (CDNA, Australian Health Protection Principal Committee (AHPPC), Australian Health Ministers Advisory Committee and the Australian Health Ministers Conference) are outlined in Appendix G.

The Australian NNDSS case definition for poliovirus infection (WPV, VAPP and VDPV), includes a definition for AFP as part of the clinical evidence (Appendix C). Except in the case of non-paralytic infection, a confirmed case of poliomyelitis requires both clinical evidence AND laboratory definitive evidence (from testing conducted by the NERL at VIDRL). A poliovirus infection that did not cause paralysis, such as in a close contact of a confirmed polio case, is verified by laboratory testing at the NERL.

The procedures for notification of a suspected case of poliomyelitis are outlined in detail in the Outbreak Response Plan and in Appendix E. In the event of a probable (polio-compatible) or confirmed case being identified, the CDNA, which involves communicable disease experts from each jurisdiction, would coordinate a national response with support from the Commonwealth CMO and the National Incident Room at the Department of Health’s Office of Health Protection where required.
Clinical confirmation of cases of poliomyelitis is undertaken by the PEP. The NERL send a questionnaire to all clinicians reporting AFP, irrespective of the age of the patient, to collect adequate clinical data to enable the PEP to classify cases. It is essential that clinicians fill out these questionnaires and return them to VIDRL in a timely manner, even if poliomyelitis is not suspected.

The PEP is made up of paediatricians, epidemiologists, neurologists and virologists who have expertise in AFP surveillance and reporting. All clinical and laboratory details of each case of AFP reported are reviewed by the PEP every two months, or as required. The decisions made by the PEP are reported to WHO after each meeting and are included in the WHO global AFP surveillance data. PEP also reports to CDNA and as such the state or territory epidemiologist may be called upon to help procure additional data to aid classification. Cases are classified by the PEP according to the following:

i. Confirmed poliomyelitis due to WPV, VAPP or VDPV;
ii. Non-polio AFP;
iii. Polio-compatible (polio not excluded);
iv. Polio-compatible (zero evidence); or
v. Non-AFP.

As these definitions are based on results of stool specimens it is important that stool specimens be collected from all patients, even when an alternative definitive diagnosis has been confirmed. A decision making tree used by the PEP when reviewing AFP cases involving children less than 15 years of age is shown in Figure 1. AFP cases are either classified as confirmed polio, discarded as non-polio AFP or if there is not enough information to exclude polio, as polio-compatible. These data are reported to the WHO and every effort is made to obtain enough information to enable a final classification of each AFP notification.

Clinical and/or laboratory confirmation of poliovirus infection would initiate activation of the response plan by the relevant state or territory health authority. A joint meeting would be convened between CDNA and PEP. There may be an emergency teleconference of the AHPPC which could be a joint teleconference with CDNA and include the chair of PEP and other relevant experts such as representatives of NERL/VIDRL and the NCC. The WHO would be notified of any confirmed case of poliovirus infection in Australia under the IHR (2005) as a public health emergency of international concern, through the National IHR Focal Point. The polio test results are also reported to WHO by NERL. Other countries’ national focal points and international disease control agencies would also be informed by the Australian Government where relevant.
Figure 1. Investigation of AFP notifications involving children less than 15 years of age by the Polio Expert Panel

*Note: confirmed polio or any polio-compatible case where polio is suspected would activate this response plan and would be reported to CDNA. Polio compatible (zero evidence) cases involve notification of an AFP case without provision of further patient information by the notifying clinician. The PEP classifies such cases after a final review reveals no evidence of clustering with other AFP notifications. WHO count the polio compatible (zero evidence) cases reported by Australia with the non-polio AFP data based on Australia’s high level of polio vaccine coverage and the national polio surveillance mechanisms in place.
POLIOVIRUS AND THE GLOBAL ERADICATION PROGRAM

Poliovirus

Poliomyelitis (polio) is a highly infectious disease caused by poliovirus, a small, non-enveloped enterovirus classified in the family Picornaviridae. Poliovirus infection occurs principally person-to-person via the faecal-oral route. The virus is ingested and replicates initially in the throat and then the gut, mostly without causing symptoms, and then is excreted in faeces. Transmission can occur as long as the poliovirus is excreted, in both symptomatic and asymptomatic cases, typically from the nasopharynx for up to a week after infection and from the faeces for 3 to 6 weeks. Cases are most infectious in the days before and after symptom onset.\(^{19}\) Vaccination may attenuate virus shedding. Transmission can be enhanced by poor sanitation. In less than 1% of cases, the virus can invade the nervous system, causing AFP, usually involving the legs. In rare cases, patients can die when their breathing muscles become paralysed. Polio can occur at any age with individuals who have not been fully immunised at risk of infection and children the most susceptible. As most cases are asymptomatic, poliovirus can spread widely before a case of paralysis is seen.

There are three serotypes of poliovirus (types 1, 2 and 3). Trivalent OPV and IPV are designed to protect against all three serotypes. Trivalent IPV is the vaccine used in Australia. Monovalent OPV vaccines also exist but are not registered for use in Australia. In 2014, WHO defined a VDPV as the VP1 region varying from the prototype Sabin poliovirus nucleotide sequence by ≥1% for types 1 and 3 and by ≥0.66% for type 2. WHO may update the definition based on further understanding of the evolutionary development of VDPVs. The variation from prototype Sabin poliovirus sequence arises from long-term virus replication that may occur in an individual with an immunodeficiency (iVDPV), or by person to person transmission in a location with low vaccine coverage and continued use of OPV (circulating or cVDPV). A number of outbreaks of paralytic polio associated with cVDPV have been reported since 2000, including the Philippines in 2001 (three cases), Indonesia in 2005 (46 cases) and an ongoing outbreak in Nigeria since 2005 (392 cases).
Global Polio Eradication Initiative

At the 1988 World Health Assembly, the ministers of health of all Member States of the WHO voted to launch a global goal to eradicate polio. The Global Polio Eradication Initiative is one of the largest public health efforts to date. At the time of its initiation in 1988, over 125 countries were considered to have endemic polio and an estimated 350,000 children were paralysed each year. By 2012, global case numbers had decreased to a low of 223 before increasing to 417 in 2013. In 2014, there remained three countries with endemic WPV: Nigeria, Pakistan and Afghanistan. Importantly poliovirus has been exported internationally from Pakistan, Cameroon and the Syrian Arab Republic during the first quarter of 2014, the traditional low season for poliovirus transmission. This prompted the WHO Director General (DG) to declare on 5 May 2014 the recent international spread of WPV a “Public Health Emergency of International Concern” and issued Temporary Recommendations under the International Health Regulations IHR (2005).(20)

The WHO Polio Eradication and Endgame Strategic Plan 2013-2018(21) and weekly WPV update can be found on the website.

The Western Pacific Region (which includes Australia), was certified as free of circulating indigenous poliovirus by WHO in October 2000. However, since immunocompromised individuals and areas with sub-optimal vaccination levels exist, further transmission would be possible within these populations once a poliovirus has been introduced. This was demonstrated in late August 2011, when an outbreak of polio occurred in China for the first time since 1999,(22) Genetic sequencing of the isolated WPVs indicated the origin to be Pakistan, which borders Xinjiang province where the outbreak occurred. A total of 21 polio cases, 10 children and 11 adults, were reported over the course of the outbreak, resulting in two deaths. A further 23 cases were reported as being clinically compatible with polio and WPVs was isolated from 14 contacts of persons with AFP and 13 healthy persons. The outbreak lasted three months from index to last polio case.

Suboptimal vaccination levels, within at risk age groups, in China and major population movements facilitated disease transmission. Five large-scale immunisation campaigns were conducted between September 2011 and April 2012, which provided more than 43 million doses of oral polio vaccine to both children and adults under the age of 40. On 10 April 2012, China was removed from the list of countries with active polio outbreaks. The outbreak investigation and response was estimated to have cost US$52 million.

Closer to Australia but within the WHO South East Asia region, Indonesia reported 305 cases of polio between March 2005 and February 2006 due to an importation that originated from Nigeria.(23) During the outbreak investigation, 46 cases of circulating VDPV were detected on the island of Madura, which lies off the east coast of Java.(24,25)

The last detection of WPV type 2 was in India in 1999, while the most recent reports of WPV type 3 were in April 2012 in Pakistan and November 2012 in Nigeria. It is increasingly likely that type 1 will be the last poliovirus serotype eradicated. The Polio Eradication and Endgame Strategic Plan 2013-2018, proposes the withdrawal of Sabin poliovirus type 2 from OPV by the end of 2016, with IPV replacing OPV for all polio vaccinations by 2020.(21) Certification of global eradication of WPV will require maintaining sensitive AFP surveillance for three years after the last detection of WPV
from any source and will be followed by surveillance for Sabin poliovirus strains and VDPVs after cessation of OPV use.

Appendix H is an extract from the Global Polio Eradication Initiative website that specifies the steps to be taken to achieve global certification.

**Australian Situation**

The first case of polio due to a WPV virus in Australia in 30 years occurred in 2007. A case of type 1 WPV was detected in a 22 year old male student from Pakistan who travelled to Australia on 2 July and presented at a Victorian State hospital on 6 July. Appropriate containment and surveillance ensured that there was no transmission within Australia. The WHO reported that as ‘the case had onset of illness in Pakistan, it is a Pakistani case, irrespective of residency status of the individual’. Therefore, Australia maintained its polio free status.

Any outbreak of poliomyelitis in Australia is considered a public health emergency. A single confirmed case of WPV or VDPV infection in Australia is considered an outbreak and would initiate activation of this response plan. As a certified polio free region Australia has a responsibility to:

- Maintain WHO certification-standard surveillance for acute flaccid paralysis;
- Ensure access to a WHO-accredited polio reference laboratory; and
- Ensure containment of WPVs and VDPVs.

Australia maintains a high immunisation rate (95% for children at two years of age as at 31 December 2013) and generally has good sanitation. The risk of transmission from an imported case is higher in areas with low immunisation coverage, inadequate sanitation or a higher than average prevalence of immunocompromised individuals. Low coverage may be a result of vaccine refusal, which has been documented in particular groups. Some Aboriginal or Torres Strait Islander communities may also be at increased risk due to their disproportionate exposure to overcrowded living conditions and inadequate essential infrastructure, although this risk is mitigated by high vaccination coverage and decreased likelihood of exposure to an imported poliovirus.

According to the National Immunisation Program Schedule, polio vaccination is recommended at 2, 4 and 6 months of age with a booster at 4 years. OPV was used in Australia prior to November 2005. Use of OPV can lead to VAPP, a rare condition in vaccine recipients and their contacts that have identical clinical presentation to WPV infection. IPV, which cannot cause VAPP, has been used in Australia since November 2005. IPV is now given in combination vaccines to reduce the number of injections received by each child. Unimmunised or under immunised individuals travelling in countries that still use OPV are at risk of VAPP, as was reported for a United States citizen, in March 2005. Monovalent OPV is available in some countries through the WHO to target a particular serotype circulating in that area, but monovalent vaccines are not registered for use in Australia. Virological testing of stool specimens is able to distinguish the serotype of virus infecting an individual, and whether it is a WPV, OPV strain or VDPV.
As a result of the switch from OPV to IPV in Australia, OPV poliovirus strains including VDPVs are not expected to be present in Australia, except in rare cases of long term virus shedding in immunocompromised individuals.

Australia continues to be free of endemic polio. The following principles underpin a coordinated national approach in the event of a case of polio diagnosed in Australia.

- Preparedness in the event of a rare biological emergency.
- Coordination of policy and operational arms at a state or territory and national level, including agreement on roles and responsibilities.
- Regular communication between key policy and operational stakeholders. These lines of communication should be established now and have the ability to deal with interactions with the media.
Biosecurity

Under the Global Action Plan for containment of WPV Phase 1, a comprehensive laboratory survey and a national inventory of laboratories holding poliovirus or poliovirus infectious materials was completed in 2002. Laboratories were asked to either dispose of the specimens, or contain them at Physical Containment Level 2 (PC2). Additionally, VIDRL has offered to replace poliovirus used in laboratory testing with authenticated OPV strains. The National Inventory of Wild Poliovirus or Poliovirus Infectious Materials is maintained by the Department of Health.

Phase 1 and 2 require the biocontainment of poliovirus or poliovirus infectious materials in a PC2 laboratory. All applications for importation of these materials will be assessed by the Department of Health and conditions relevant to the global stage of eradication applied. Any subsequent importation of a WPV or poliovirus infectious materials must be notified to the National Laboratory Containment Focal Point (epi@health.gov.au) in the Office of Health Protection, Australian Government Department of Health. Once global transmission has been interrupted, targeted for the end of 2014, a second survey will be conducted, combined with a national communication to educate laboratories on the importance of finding and destroying any remaining stock.

Phase 3 biocontainment, applies 1 year after global transmission has been interrupted and includes the global destruction and containment of WPV. Retention of WPV materials will be prohibited except in designated WHO essential facilities.

Laboratory workers should be fully vaccinated and must use PC2 procedures and facilities when handling poliovirus or specimens that may contain poliovirus. In the event of a laboratory acquired case of poliovirus infection, the Public Health Laboratory Network (PHLN) would be involved in investigation of the incident and contact tracing, along with the State or Territory Health Authority.
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APPENDICES

Appendix A. Flow diagram of key points in the outbreak response plan

Appendix B. Key Stakeholders Involved in a Suspected Case of Poliomyelitis

Appendix C. Case definition for Poliomyelitis and Poliovirus Infection (including a definition of AFP as part of the clinical evidence)

Appendix D. Referral of stool specimens to the NERL for viral testing

Appendix E. Procedure for clinicians for notification of a case of AFP or a suspected case of AFP

Appendix F. Key Contacts

Appendix G. CDNA Reporting Structure

Appendix H. Achieving Certification of Global Polio Eradication

Appendix I. Clinical Questionnaire for reporting AFP (paediatric cases; less than 15 years of age)

Appendix J. Clinical Questionnaire for reporting AFP (all ages)

Appendix K. AFP 60 day follow up questionnaire

Appendix L. List of Acronyms
Appendix A. Flow Diagram of Key Points in the Outbreak Response Plan

1. Clinical or laboratory report of suspected polio and/or poliovirus infection
2. Isolation of patient
3. Epidemiological investigation (including contact tracing)
4. Tracing and management of contacts
5. Monitoring of stools for poliovirus
6. Increased education and surveillance for AFP and poliovirus
Appendix B. Key Stakeholders Involved in a Suspected Case of Poliomyelitis

The key stakeholders involved in an investigation of a suspected case of poliomyelitis are listed below and some key contact details are included in Appendix F:

- The index case, their family or carers and their primary health care provider;
- Contacts of the index case;
- Diagnostic networks of neurologists, neuropathologists, paediatricians;
- Hospitals and care facilities in the public and private sectors;
- General practitioners;
- NERL at VIDRL;
- The Australian Paediatric Surveillance Unit (APSU- paediatric cases only);
- The Paediatric Active Enhanced Disease Surveillance Unit (PAEDS);
- The Communicable Diseases Network Australia (CDNA);
- The Public Health Laboratory Network (PHLN);
- The Polio Expert Panel (PEP);
- The Chief Health Officer (CHO)/ Director of Public Health in the affected jurisdiction, and later all CHOs/Directors of Public Health;
- The Commonwealth Chief Medical Officer (CMO), the Office of Health Protection in the Department of Health and the broader public health sector;
- The Australian Health Protection Principal Committee (AHPPC);
- WHO IHR Focal Point;
- The Department of Immigration and Border Protection (DIBP);
- The Department of Defence;
- The WHO Western Pacific Regional Office, Manila;
- Counselling and patient support services;
- Lawyers, civil organisations regarding confidentiality and liability issues;
- The Australian and international media; and
- The broader Australian and international community.
Appendix C. Case Definition for Poliomyelitis (Paralytic and Non-Paralytic) Infection

This is case definition Version 1.4 implemented on 1 January 2014.

Any further revisions are available from the Australian Government Department of Health Website

1. Poliomyelitis (paralytic infection)

Reporting

Both **confirmed cases** and **probable cases** should be notified.

Confirmed case

A confirmed case requires laboratory definitive evidence AND clinical evidence.

**Laboratory definitive evidence**

Wild poliovirus infection
Isolation of wild poliovirus (confirmed in the National Enterovirus Reference Laboratory) OR detection of wild poliovirus by nucleic acid testing (confirmed in the National Poliovirus Enterovirus Laboratory).

Vaccine-associated paralytic poliomyelitis (**VAPP**)
Isolation of Sabin-like poliovirus (confirmed in the National Enterovirus Reference Laboratory) OR detection of Sabin-like poliovirus by nucleic acid testing (confirmed in the National Enterovirus Reference Laboratory).

Vaccine derived poliovirus (**VDPV**) infection
Isolation of poliovirus (confirmed in the National Enterovirus Reference Laboratory) OR detection of poliovirus by nucleic acid testing (confirmed in the National Enterovirus Reference Laboratory), characterised as a vaccine derived poliovirus according to the current definition of the World Health Organization (reported by the National Enterovirus Reference Laboratory).

Clinical evidence

Any child under 15 years of age with acute flaccid paralysis* (including Guillain-Barré syndrome) or any person of any age with paralytic illness if polio is suspected.
For a case to be classified as VAPP the determination must be made by the Polio Expert Panel.

Probable case

A probable case of poliomyelitis (paralytic infection) requires clinical evidence AND the case not discarded as non-polio paralytic illness by Polio Expert Panel.

Clinical evidence

As with confirmed case.
*Acute flaccid paralysis syndrome is characterised by rapid onset of weakness of an individual’s extremities, often including weakness of the muscles of respiration and swallowing, progressing to maximum severity within 1-10 days. The term “flaccid” indicates the absence of spasticity or other signs of disordered central nervous system (CNS) motor tracts such as hyperreflexia, clonus, or extensor plantar responses. (Excerpt from *Acute onset flaccid paralysis*; World Health Organization 1993; WHO/MNH/EPI/93.3. Geneva)

2. Poliovirus (non-paralytic) infection

Reporting

Isolation or detection of poliovirus from clinical specimens with laboratory definitive evidence should be notified.

This case definition should be used for asymptomatic patients or patients with illness not consistent with acute flaccid paralysis.

**Laboratory definitive evidence**

Wild poliovirus infection
Isolation of wild poliovirus (confirmed in the National Enterovirus Reference Laboratory) OR detection of wild poliovirus by nucleic acid testing (confirmed in the National Enterovirus Reference Laboratory).

Sabin-like poliovirus infection
Isolation of Sabin-like poliovirus (confirmed in the National Enterovirus Reference Laboratory) OR detection of Sabin-like poliovirus by nucleic acid testing (confirmed in the National Enterovirus Reference Laboratory) except where there has been vaccination with Sabin oral polio vaccine in the six weeks* prior to the date of specimen collection.

* Note: This period may be longer for immunocompromised individuals.

Vaccine derived poliovirus (VDPV) infection
Isolation of poliovirus (confirmed in the National Enterovirus Reference Laboratory) OR detection of poliovirus by nucleic acid testing (confirmed in the National Enterovirus Reference Laboratory), characterised as a vaccine derived poliovirus according to the current definition of the World Health Organization (reported by the National Enterovirus Reference Laboratory).

### Appendix D. Referral of stool specimens to the National Enterovirus Reference Laboratory.

1. Collect two stool specimens at least 24 hours apart and within 14 days of onset of paralysis, in sterile containers. Each specimen should be approximately five grams. Two specimens are requested due to intermittent virus shedding.
2. Store the specimens at 4°C until ready to send. If the shipment cannot be sent for more than 72 hours, freeze the specimens.
3. Complete the AFP specimen laboratory request form and include with the shipment.
4. Send the specimens to the National Enterovirus Reference Laboratory via the local hospital pathology referral department. Request that the shipment be packaged according to the International Air Transport Association (IATA) Packing Instruction (PI) 650 and classified as UN 3373 biological substance category B.

5. The shipment can be sent by overnight courier, with sufficient ice bricks to keep the specimens chilled while in transit. Dry ice is not needed.

Address the shipment to:
National Enterovirus Reference Laboratory
Victorian Infectious Diseases Reference Laboratory (VIDRL)
The Doherty Institute
792 Elizabeth Street
Melbourne 3000
Victoria

Telephone: (03) 9342 9607 (direct to lab), (03) 9342 9600 (24 hour contact)

6. The National Enterovirus Reference Laboratory will pay for the shipping costs. If the local hospital pathology referral department does not routinely send shipments to VIDRL, contact the laboratory for further information. The specimens must be packed according to IATA PI 650. If a member of staff is not qualified for the shipment of biological specimens, contact the National Enterovirus Reference Laboratory for assistance.

7. Notify the National Enterovirus Reference Laboratory of the impending shipment. Contact the laboratory if you have any questions or difficulties with arranging the shipment:
Telephone: (03) 9342 9607 / 9600
Facsimile: (03) 9342 9665
Email: enterovirus@mh.org.au
Acute Flaccid Paralysis Specimen Referral

To accompany stool specimens to the National Enterovirus Reference Laboratory, Victorian Infectious Diseases Reference Laboratory (VIDRL).

To facilitate the collation of data, we request completion of the following details.
Contact the National Enterovirus Reference Laboratory if you have any questions.
Telephone: (03) 9342 9607
Email: enterovirus@mh.org.au

Laboratory request form:

<table>
<thead>
<tr>
<th>Patient’s Name:</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postcode:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of birth of patient:</td>
<td>Day</td>
<td>Month</td>
</tr>
<tr>
<td>If date of birth is unknown, give age in years / months:</td>
<td>Years</td>
<td>Months</td>
</tr>
<tr>
<td>Date of onset of paralysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date first stool specimen collected:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date second stool specimen collected:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date stool specimen sent:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of most recent polio vaccination:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preliminary clinical diagnosis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical diagnosis in hospital:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of person to whom laboratory results should be sent:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone number:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax number:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(For use by the National Enterovirus Reference Laboratory)

<table>
<thead>
<tr>
<th>Date received:</th>
<th>Day</th>
<th>Month</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of person receiving specimen at NERL:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian AFP case number</td>
<td>AUS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Was specimen in good condition?*

*Criteria for "good" condition = adequate mass, no leakage, no desiccation, and temperature indicator or presence of ice indicating reverse cold chain was maintained.

Adapted from the Manual for virological investigation of polio, WHO/EPI/GEN/97.0
Appendix E. Procedure for clinicians to notify a case of AFP or suspected poliomyelitis (all ages)

Revised from National Documentation for Certification of Poliomyelitis Eradication in Australia, 2000

Identify a case of AFP or suspected poliomyelitis

↓

Immediate phone report to NERL at VIDRL

(For patients under 15 years, also monthly reporting on APSU cards)

↓

Order 2 stool specimens at least 24 hours apart and within 14 days of onset of paralysis

Questionnaire sent to clinician

↓

Local laboratory will send specimens to NERL for testing

↓

Keep a record of the case you have notified

↓

Complete and return questionnaire to VIDRL

↓

Complete and return 60 day follow up questionnaire to VIDRL if requested

VIDRL will notify the State or Territory health authority if a poliovirus is isolated and clinicians will be contacted as part of the activation of this response plan to assist in the epidemiological investigation of the case.
(1) REPORTING INSTRUCTIONS FOR AFP CASES IN CHILDREN

**Telephone reporting:** Report all cases, *immediately by telephone* to the NERL at VIDRL on (03) 9342 9607.

**APSU reporting:** For children under 15 years of age, in addition to the NERL also report cases on the *monthly APSU report card.*

Collection of stool specimens from cases of AFP for viral culture: Due to intermittent shedding, collect 2 stool specimens at least 24 hours apart and within 2 weeks of onset of paralysis in a sterile container and send them to your local laboratory who will forward the specimens to the NERL (the WHO accredited National Polio Reference Laboratory) in Melbourne as per Appendix D.

- On the request form the patient must be identified as having AFP;
- The local laboratory should be informed that the specimens must be forwarded to the NERL for exclusion of poliovirus;
- All costs for transport and analysis will be borne by the NERL. Information regarding specimen transport can be obtained from the NERL on (03) 9342 9607 or at the [website](#); and
- The NERL will send results to your local laboratory and the Polio Expert Panel (PEP).

**Follow-up of clinical information:** A clinical questionnaire requesting further details may be sent by the NERL to clinicians reporting a case of AFP or suspected poliomyelitis (Appendix I). A further follow-up questionnaire is sent to clinicians 60 days after the onset of paralysis to determine the outcome of the patient if required (Appendix K).

(2) REPORTING INSTRUCTIONS FOR SUSPECTED CASES OF POLIOMYELITIS IN A PERSON OF ANY AGE

**Telephone reporting:** Report all cases, irrespective of age, *immediately by telephone* to the State or Territory Health Department (Appendix F). In addition, telephone the NERL at VIDRL on (03) 9342 9607 to discuss collection of specimens;

Collection of stool specimens from cases of suspected poliomyelitis for viral culture: Due to intermittent shedding, collect 2 stool specimens at least 24 hours apart and within 2 weeks of onset of paralysis in a sterile container and send them to your local laboratory who will forward the specimens to the NERL (the WHO accredited National Enterovirus Reference Laboratory) in Melbourne as per Appendix D.

- On the request form the patient must be identified as having suspected poliomyelitis;
- The local laboratory should be informed that the specimens must be forwarded to the NERL for exclusion of poliovirus;
- All costs for transport and analysis will be borne by the NERL. Information regarding specimen transport can be obtained from the NERL on (03) 9342 9607 or at the [website](#); and
- The NERL will send results to your local laboratory and the PEP.
Follow-up of clinical information: A clinical questionnaire requesting further details will be sent by the NERL to clinicians reporting a case of suspected poliomyelitis (Appendix J). A further follow-up questionnaire may be sent to clinicians 60 days after the onset of paralysis to determine the outcome of the patient (Appendix K).
## Appendix F. Key Contacts

<table>
<thead>
<tr>
<th>The National Enterovirus Reference Laboratory (<a href="http://www.vidrl.org.au">www.vidrl.org.au</a>)</th>
<th>The NERL should be informed of AFP cases and suspected polio cases as early as possible:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victorian Infectious Diseases Reference Laboratory (VIDRL)</td>
<td>The Doherty Institute</td>
</tr>
<tr>
<td>792 Elizabeth St</td>
<td>792 Elizabeth St</td>
</tr>
<tr>
<td>Melbourne 3000 Victoria</td>
<td>Melbourne 3000 Victoria</td>
</tr>
<tr>
<td>Telephone: (03) 9342 9607 (direct to lab) (03) 9342 9600 (24 hour reporting)</td>
<td>Telephone: (03) 9342 9607 (direct to lab) (03) 9342 9600 (24 hour reporting)</td>
</tr>
<tr>
<td>Email: <a href="mailto:enterovirus@mh.org.au">enterovirus@mh.org.au</a></td>
<td>Email: <a href="mailto:enterovirus@mh.org.au">enterovirus@mh.org.au</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Australian Paediatric Surveillance Unit (<a href="http://www.apsu.org.au">www.apsu.org.au</a>)</th>
<th>Clinicians should contact the APSU with any enquiries regarding the monthly report card:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Paediatric Surveillance Unit</td>
<td>Australian Paediatric Surveillance Unit</td>
</tr>
<tr>
<td>Locked Bag 4001</td>
<td>Locked Bag 4001</td>
</tr>
<tr>
<td>Westmead NSW 2145</td>
<td>Westmead NSW 2145</td>
</tr>
<tr>
<td>Telephone: (02) 9845 3005 (office hours- for enquiries) Fax (02) 9845 3082</td>
<td>Telephone: (02) 9845 3005 (office hours- for enquiries) Fax (02) 9845 3082</td>
</tr>
<tr>
<td>Email: <a href="mailto:APSU@chw.edu.au">APSU@chw.edu.au</a></td>
<td>Email: <a href="mailto:APSU@chw.edu.au">APSU@chw.edu.au</a></td>
</tr>
</tbody>
</table>

| Department of Health | Department of Health |
| Chief Medical Officer and WHO IHR Focal Point | Telephone: (02) 6289 7400 |
| National Incident Room | Fax: (02) 6289 4044 |
| Office of Health Protection | email: news@health.gov.au |
| t: (+61) 2 6289 3030 (24 hours) | |
| f: (+61) 2 6289 3041 | |
| email: health.ops@health.gov.au | |
Key State and Territory Health Authority Contacts

All cases of suspect poliomyelitis should be reported immediately to the local health authority:

<table>
<thead>
<tr>
<th>Health Protection Service</th>
<th>Public Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Health</td>
<td>WA Department of Health</td>
</tr>
<tr>
<td>Locked Bag 5005</td>
<td>PO Box 8172</td>
</tr>
<tr>
<td>Weston Creek ACT 2611</td>
<td>Perth Business Centre</td>
</tr>
<tr>
<td>Telephone: (02) 6205 1700</td>
<td>Perth WA 6849</td>
</tr>
<tr>
<td>(24 hours)</td>
<td>Telephone:</td>
</tr>
<tr>
<td>Email: <a href="mailto:cdc@act.gov.au">cdc@act.gov.au</a></td>
<td>(08) 9388 4878</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communicable Diseases Branch</th>
<th>Public Health SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW Ministry of Health</td>
<td>Department of Health</td>
</tr>
<tr>
<td>Locked Mail Bag 961</td>
<td>PO Box 287</td>
</tr>
<tr>
<td>North Sydney NSW 2059</td>
<td>Rundle Mall</td>
</tr>
<tr>
<td>Telephone: (02) 9391 9000</td>
<td>Adelaide SA 5000</td>
</tr>
<tr>
<td></td>
<td>Telephone: (08) 8226 7107</td>
</tr>
<tr>
<td>Public Health Unit 1300 066 055</td>
<td>Communicable Disease Control Branch</td>
</tr>
<tr>
<td></td>
<td>1300 232 272 (24 hours)</td>
</tr>
<tr>
<td></td>
<td>Email: <a href="mailto:cdb@health.sa.gov.au">cdb@health.sa.gov.au</a></td>
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<table>
<thead>
<tr>
<th>Communicable Diseases Unit</th>
<th>Communicable disease Prevention and Control Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>QLD Health</td>
<td>Department of Health</td>
</tr>
<tr>
<td>PO Box 2368</td>
<td>GPO Box 4057</td>
</tr>
<tr>
<td>Fortitude Valley</td>
<td>Melbourne VIC 3000</td>
</tr>
<tr>
<td>Brisbane City QLD 4000</td>
<td>Telephone: 1300 253 942</td>
</tr>
<tr>
<td>Telephone: (07) 3234 0111</td>
<td></td>
</tr>
<tr>
<td>Communicable Diseases Unit</td>
<td>Notifying Infectious Diseases</td>
</tr>
<tr>
<td>(07) 3328 9724</td>
<td>Telephone: 1300 651 160</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Centre for Disease Control</th>
<th>Communicable Diseases Prevention Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Health</td>
<td>Department of Health and Human Services</td>
</tr>
<tr>
<td>PO Box 40596</td>
<td>GPO Box 125</td>
</tr>
<tr>
<td>Casuarina NT 0811</td>
<td>Hobart TAS 7001</td>
</tr>
<tr>
<td>Telephone: (08) 8999 2400</td>
<td>Telephone: 1300 135 513</td>
</tr>
<tr>
<td>For notifiable diseases</td>
<td>Public Health Hotline 1800 671 738</td>
</tr>
<tr>
<td>contact the region directly:</td>
<td></td>
</tr>
<tr>
<td>Darwin (08) 8922 8044</td>
<td></td>
</tr>
<tr>
<td>Alice Springs (08) 8951 7540</td>
<td></td>
</tr>
<tr>
<td>Katherine (08) 8973 9049</td>
<td></td>
</tr>
<tr>
<td>Tennant Creek (08) 8962 4250</td>
<td></td>
</tr>
<tr>
<td>Nhulunbuy (08) 8997 0282</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G. CDNA Reporting Structure

SCoH
Standing Council on Health

AHMAC
Australian Health Minister’s Advisory Council

AHPPC
Australian Health Protection Principal Committee

CDNA
Communicable Diseases Network Australia

PEP
Polio Expert Panel
Appendix H. Achieving Certification of Global Polio Eradication

In 1997, the Global Commission for the Certification of the Eradication of Poliomyelitis (GCC) finalized the criteria for certifying whether the goal of polio eradication is achieved. Certification is conducted on a regional basis. Each region (there are 6 WHO regions - the Americas, the Western Pacific region, the European Region, the Eastern Mediterranean Region and Southeast Asian Region and the African Region) can consider certification only when all countries in the area demonstrate the absence of WPV transmission for at least three consecutive years in the presence of excellent surveillance.

In addition to achieve the certification of global polio eradication, all facilities holding WPV infectious and potentially infectious materials must have implemented bio-containment measures. The *Global Action Plan to Minimize Post Eradication Poliovirus Facility Associated Risk* 3rd Edition (2009) outlines the activities to minimize the risk of the reintroduction of WPV from laboratories to the community.

What is required to achieve global certification?

1. Achieving certification-standard surveillance

In endemic regions

- Achieve and sustain certification standard surveillance for acute flaccid paralysis (AFP) at the national level.
- Identify and close any gaps in surveillance performance at the sub-national level in all countries.
- Increase the speed of surveillance and virologic data analysis to ensure timely emergency response.

In certified polio-free regions

- Maintain certification-standard surveillance for acute flaccid paralysis
- Ensure highest possible immunity levels against wild poliovirus
- Develop action plans for responding rapidly to outbreaks of wild poliovirus
- Integrate AFP reporting into national surveillance mechanisms to respond to other important diseases.

2. Ensuring access to a WHO-accredited laboratory

- Reduce the time required for intratypic differentiation (ITD) results to be available from endemic areas;
- ITD capacity established in all polio reservoir countries
- Sustain the international capacity to process all specimens from AFP cases in WHO-accredited laboratories through global certification and OPV cessation

3. Ensuring containment of WPVs and VDPVs

- Complete laboratory survey and inventory activities in all polio-free countries.
• Prepare for implementation of phase II laboratory containment activities prior to global certification.
• Initiate phase II containment activities in all countries by the end of 2005.
• Complete BSL-3/polio containment in facilities producing IPV from WPV.

4. Completing the certification process

• Regional Certification Commissions (RCC) in the remaining three polio-endemic regions to train National Certification Commissions (NCC)
• NCCs to collect, review and decide on the national documentation through consultations.

By the end of 2005. The GCC will have finalised: the data requirements for global certification from the three certified polio-free regions (end of 2002); the role of environmental surveillance as a supplemental strategy; and mechanisms for reviewing and verifying documentation on the containment of laboratory stocks and IPV production.

What is certification standard surveillance?

• the ability to detect at least one case of non-polio acute flaccid paralysis (AFP) for every 100 000 children under 15 years of age
• two adequate specimens collected from at least 80% of cases of acute flaccid paralysis
• all specimens should be processed at a WHO accredited laboratory
Appendix I. Clinical questionnaire for reporting AFP

Thank you for contributing to AEP surveillance and the WHO polio eradication program.

PLEASE USE THE BACK OF THIS QUESTIONNAIRE IF YOU HAVE ANY FURTHER INFORMATION THAT MAY HELP US.
Appendix J. Clinical questionnaire for reporting AFP (all ages)
Appendix K. Acute Flaccid Paralysis 60 day follow up Questionnaire

60 DAY FOLLOW UP QUESTIONNAIRE

Reporting Clinician's Details
1. Month/Year of Report
2. Dr Name
3. Dr Address
4. Fax ()
5. Email

Patient Details
6. First 2 letters of Surname
7. First 2 letters of Given Name
8. Hospital Of Admission
9. Date of Birth
10. Sex
11. Postcode
12. Of Aboriginal/Torres Strait Islander descent?

60 Day Follow-up
13. Did the patient survive the illness? Yes No DK
14. Does the patient have any residual paralysis at 60 days after onset of paralysis? Yes No DK
15. If YES, what is the site of paralysis?
16. Is there residual sphincter dysfunction? Yes No DK
17. Has your diagnosis changed since you originally notified this case? Yes No
18. If yes, please indicate the final diagnosis (below) and the clinical features and investigation findings that support the revised diagnosis.

19. Final Diagnosis
Please indicate the final diagnosis on this table.

Peripheral Neuropathy
- Guillain-Barré syndrome (acute post-infectious polyneuropathy)
- Acute axonal neuropathy
- Neuropathies of infectious diseases
- Acute toxic neuropathies (heavy metals)
- Focal mononeuropathy

Anterior Horn Cell Disease
- Acute poliomyelitis
- Vaccine-associated poliomyelitis
- Other neurotrophic viruses

Acute Myelopathy
- Transverse myelitis
- Acute disseminated encephalomyelitis (ADEM)
- Spinal cord ischaemia
- Spinal cord injury or compression e.g. Tumour, trauma
- Peri-operative complication

Muscle Disorders
- Polymyositis, dermatomyositis
- Periodic paralyses
- Mitochondrial diseases (infantile type)
- Viral myositis
- Drug-induced paralysis (specify)

Systemic Disease
- Acute porphyria
- Critical illness myopathy
- Conversion disorder
- Disorders of neuromuscular transmission
- Botulism
- Insecticide e.g. organophosphate poisoning
- Tick bite paralysis
- Myasthenia gravis
- Snake bite
- Other (specify)

Do you have any other comments on this case?

Thank you for contributing to polio surveillance and the WHO polio eradication program.
## Appendix L. List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFP</td>
<td>Acute Flaccid Paralysis</td>
</tr>
<tr>
<td>APSU</td>
<td>Australian Paediatric Surveillance Unit</td>
</tr>
<tr>
<td>ATAGI</td>
<td>Australian Technical Advisory Group on Immunisation</td>
</tr>
<tr>
<td>CDNA</td>
<td>Communicable Diseases Network Australia</td>
</tr>
<tr>
<td>CHO</td>
<td>Chief Health Officer</td>
</tr>
<tr>
<td>CMO</td>
<td>Commonwealth Chief Medical Officer</td>
</tr>
<tr>
<td>DIBP</td>
<td>Department of Immigration and Border Protection</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IP</td>
<td>International Packaging</td>
</tr>
<tr>
<td>IHR</td>
<td>International Health Regulations</td>
</tr>
<tr>
<td>IPV</td>
<td>Inactivated Polio Vaccine</td>
</tr>
<tr>
<td>NCC</td>
<td>National Committee for the Certification of Polio Eradication</td>
</tr>
<tr>
<td>NNDSS</td>
<td>National Notifiable Diseases Surveillance System</td>
</tr>
<tr>
<td>NERL</td>
<td>National Enterovirus Reference Laboratory</td>
</tr>
<tr>
<td>OPV</td>
<td>Oral Polio Vaccine</td>
</tr>
<tr>
<td>PAEDS</td>
<td>Paediatric Active Enhanced Disease Surveillance</td>
</tr>
<tr>
<td>PC2</td>
<td>Physical Containment Level 2</td>
</tr>
<tr>
<td>PEP</td>
<td>Polio Expert Panel</td>
</tr>
<tr>
<td>PHLN</td>
<td>Public Health Laboratory Network</td>
</tr>
<tr>
<td>RCC</td>
<td>WHO Regional Commission for the Certification of Poliomyelitis</td>
</tr>
<tr>
<td></td>
<td>Eradication in the WPR</td>
</tr>
<tr>
<td>VAPP</td>
<td>Vaccine Associated Paralytic Poliomyelitis</td>
</tr>
<tr>
<td>VDPV</td>
<td>Vaccine Derived Poliovirus</td>
</tr>
<tr>
<td>VIDRL</td>
<td>Victorian Infectious Diseases Reference Laboratory</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WPRO</td>
<td>WHO Western Pacific Region</td>
</tr>
</tbody>
</table>