



# National Polio Outbreak Preparedness and Response Framework for Aotearoa New Zealand

2023



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# Glossary

Term	Definition
<b>acute flaccid paralysis (AFP)</b>	A clinical manifestation characterised by sudden onset of weakness or paralysis and reduced muscle tone.
<b>ambiguous VDVP (aVDPV)</b>	A vaccine-derived poliovirus (VDPV) isolate from individuals or from environmental samples, without evidence of circulation and from individuals with no known immunodeficiency. A VDPV isolate should only be classified as 'ambiguous' once additional investigations have excluded that it is part of an ongoing chain of transmission; that is, a circulating vaccine-derived poliovirus (cVDPV), or derived from an immune-deficiency associated vaccine-derived poliovirus (iVDPV). A VDPV classified as 'ambiguous' may need to be reclassified as 'circulating' if genetically linked isolates are found subsequently.
<b>circulating vaccine-derived poliovirus (cVDPV)</b>	VDPV isolates for which there is evidence of person-to-person transmission in the community. This is defined as genetically linked VDPVs, isolated from: <sup>1</sup> <ul style="list-style-type: none"><li>• at least two individuals (not necessarily AFP cases), who are not direct (ie, household) contacts; or</li><li>• one individual and one or more environmental surveillance samples; or</li><li>• two or more environmental surveillance samples if they were collected at more than one distinct environmental surveillance collection site (no overlapping of catchment areas), or from one site if collection times were more than two months apart.</li></ul>
<b>immune-deficiency associated VDPV (iVDPV)</b>	<p>Prolonged replication of VDPVs has been observed in a small number of people with primary immunodeficiencies. Because they are not able to mount an immune response, these people are not able to clear the intestinal vaccine-virus infection, which is usually cleared within six to eight weeks. They therefore excrete iVDPVs for prolonged periods. These are classified based on genetic + epidemiological evidence — for example, newly detected VDPV without known genetically linked previous VDPV + evidence of primary immunodeficiency following detailed field investigation.</p> <p>The occurrence of iVDPVs is very rare. Only 111 cases have been documented worldwide since 1962. Of these, most stopped excretion within six months or died.</p>
<b>inactivated polio vaccine (IPV)</b>	A vaccine that is injected and works by producing protective antibodies in the blood, thus preventing the spread of poliovirus to the central nervous system. However, it induces only very low levels of immunity to poliovirus locally, inside the gut. IPV provides individual protection against polio paralysis but, unlike bOPV or nOPV2, has unknown efficacy against asymptomatic infection and the subsequent spread of poliovirus.

<sup>1</sup> Global Polio Eradication Initiative. 2016. *Classification and reporting of vaccine-derived polioviruses (VDPV)*. URL: [https://polioeradication.org/wp-content/uploads/2016/09/Reporting-and-Classification-of-VDPVs\\_Aug2016\\_EN.pdf](https://polioeradication.org/wp-content/uploads/2016/09/Reporting-and-Classification-of-VDPVs_Aug2016_EN.pdf) (accessed 26 September 2023).



<b>novel oral polio vaccine type 2 (nOPV2)</b>	The novel oral polio vaccine type 2 (nOPV2) is a modified version of the existing type 2 monovalent OPV (mOPV2), which is similar to bOPV but aims at protecting against poliovirus type 2.
<b>oral poliovirus vaccine (OPV)</b>	There are different types of oral poliovirus vaccine, which may contain one, a combination of two, or all three different serotypes of attenuated vaccine.
<b>monovalent oral poliovirus vaccine (mOPV)</b>	Monovalent oral polio vaccines (mOPV) confer immunity to just one of the three serotypes of OPV. There are licensed mOPVs for type 1 and type 3, and mOPV type 2 has been stockpiled in the event of a cVDPV type 2 outbreak.
<b>bivalent oral poliovirus vaccine (bOPV)</b>	Following April 2016, the trivalent oral poliovirus vaccine was replaced with the bivalent oral poliovirus vaccine (bOPV) in routine immunisation around the world. Bivalent OPV contains only attenuated virus of serotypes 1 and 3.
<b>trivalent oral poliovirus vaccine (tOPV)</b>	Prior to April 2016, the trivalent oral poliovirus vaccine (tOPV) was the predominant vaccine used for routine immunisation against poliovirus. tOPV consists of a mixture of live, attenuated polioviruses of all three serotypes.
<b>Sabin-like</b>	<p>Sabin-like polioviruses are those that either have a genotype that is the same as the standard Sabin strain in OPV<sup>2</sup> or that has begun to diverge, but to a lesser degree than those that are able to cause paralysis, known as a vaccine-derived poliovirus.</p> <p>Sabin-like viruses are commonly detected in the population and the environment when OPV is used in routine immunisation or supplementary immunisation activities with OPV. This includes types 1, 2 and 3, corresponding to the types of live attenuated poliomyelitis viruses used in OPV.<sup>3</sup></p>
<b>vaccine-associated paralytic poliomyelitis (VAPP)</b>	Vaccine-associated paralytic poliomyelitis (VAPP) occurs when an OPV virus strain reverts to neurovirulence during replication in the gastrointestinal tract of a susceptible host. It may occur in recently vaccinated infants, individuals with B cell immunodeficiency, and direct contacts of OPV recipients.
<b>vaccine-derived poliovirus (VDPV)</b>	<p>Vaccine-derived poliovirus (VDPV) is the live, attenuated strain of the poliovirus contained in the OPV that has changed and reverted to a form that can cause paralysis in humans and has the capacity for sustained circulation. Vaccine-derived polioviruses differ from the parental (original) Sabin strains found in the vaccine by 1% to 15% of VP1 nucleotides. This is a measure of genetic change that scientists use to monitor the circulation of viruses.</p> <p>VDPV includes types 1, 2 and 3, defined below.</p>
<b>VDPV types 1 and 3 (VDPV1 and VDPV3)</b>	VDPV1 and VDPV3 are polioviruses that are > 1% divergent (ie, $\geq 10$ nucleotide differences in the genetic sequence) from the corresponding OPV strain in the complete viral protein 1 (VP1) genomic coding region. <sup>4</sup>

<sup>2</sup> May be called Sabin, but official Global Polio Laboratory Network guidance would classify this as Sabin-like.

<sup>3</sup> Noting that there are different types of OPV (eg, trivalent with types 1, 2, and 3, and nOPV2). See section 2.4.1.

<sup>4</sup> Alleman MM, Chitale R, Burns CC, et al. 2018. Vaccine-derived poliovirus outbreaks and events — three provinces, Democratic Republic of the Congo, 2017. *Morbidity and Mortality Weekly Report* 67(10): 300. URL: [dx.doi.org/10.15585/mmwr.mm6710a4](https://dx.doi.org/10.15585/mmwr.mm6710a4) (accessed 26 September 2023).



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<b>VDPV type 2 (VDPV2)</b>	VDPV2s are >0.6% divergent (ie, $\geq 6$ nucleotide differences in the genetic sequence).
<b>wild poliovirus (WPV)</b>	Naturally occurring poliovirus. Polioviruses with greater than 15% sequence difference in the VP1 coding region are defined as wild polioviruses. WPV includes types 1, 2 and 3 (WPV1, WPV2, WPV3).

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# Key points

## Background and international context

- Poliomyelitis (polio) is caused by wild poliovirus types 1, 2 and 3 (WPV1, WPV2 and WPV3), or by live vaccine-derived poliovirus (VDPV). WPV2 was declared eradicated by the World Health Organization (WHO) in September 2015, with the last virus detected in 1999. WPV3 was declared eradicated in October 2019. It was last detected in November 2012. Only WPV1 remains.
- Polio remains endemic in two countries: Afghanistan and Pakistan.
- In 2022 there was an increase in polio activity in areas that have previously seen eradication. This includes cases of acute flaccid paralysis (AFP) in the United States, Israel and Indonesia and wastewater detections of poliovirus in several countries, including the United Kingdom and Canada.
- Up-to-date information on the current spread of different poliovirus strains around the world can be found on the Polio Global Eradication Initiative website.<sup>5</sup>

## Local context

- Aotearoa New Zealand (hereafter Aotearoa) has been declared polio free, with the last WPV case occurring in 1977.
- Currently some districts have immunisation rates <80%, and in particular there are significant inequities for Māori populations, which means that there is an increased risk that if poliovirus was introduced into Aotearoa it could spread among pockets of under-immunised young children.
- As part of the WHO initiative to eradicate polio, Aotearoa has a programme of AFP surveillance and investigates all cases of AFP in children under the age of 15. Although the WHO target for capture of AFP (incidence rate of 1/100,000 in children under 14 years of age) has been reached from 2019 to 2022, the rate of the required stool testing was below the WHO target of 80% (around 50–70%). Additionally, given that only a small minority of infections spread to the central nervous system and manifest as AFP, if poliovirus was circulating in the community, AFP surveillance may be slower to detect this.
- Aotearoa initiated environmental (wastewater) surveillance in January 2023.

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<sup>5</sup> See 'Public Health Emergency status' at [polioeradication.org/polio-today/polio-now/public-health-emergency-status](https://polioeradication.org/polio-today/polio-now/public-health-emergency-status) and 'Outbreak countries' at [polioeradication.org/where-we-work/polio-outbreak-countries](https://polioeradication.org/where-we-work/polio-outbreak-countries)



# Likely polio scenarios and suggested responses

- The most likely scenario that might occur in Aotearoa is detection of poliovirus in an environmental sample (ie, wastewater). Less likely, but important to plan for, is a case of polio caused by a WPV or by a VDPV. We have also planned for a response following identification of a contact of a known case overseas, and facility-related exposure to live polioviruses.
- Any of these scenarios will trigger a risk assessment, and national responses coordinated through established mechanisms. Subsequent actions would be determined through decision making with key stakeholders, including Te Aka Whai Ora | the Māori Health Authority; Te Whatu Ora | Health New Zealand; Whaikaha | the Ministry of Disabled People; and Pacific health teams from Manatū Hauora | the Ministry of Health and/or Te Whatu Ora. The following table shows potential responses to each scenario, which should be considered based on specific contextual features.





# Potential polio scenarios and responses

Actions to address a higher risk situation should be considered in any scenario initially, based on the precautionary principle, given the potential delays in genetic sequencing of the virus. The response can be reassessed as further genetic and epidemiological characterisation becomes available.

Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk:	Higher risk:	Higher risk:	Lower risk:	Higher risk:		
	<b>No risk or little risk:</b> Sabin or Sabin-like type 1 or 3 (likely shedding following OPV) <sup>a</sup>	<b>Lower risk:</b> No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	<b>Higher risk:</b> New VDPV, even without evidence of community transmission	<b>Higher risk:</b> Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	<b>Lower risk:</b> Imported case <sup>c</sup>	<b>Higher risk:</b> Community transmission	Risk depends on type of poliovirus detected	<b>Lower risk</b>
<b>Enhanced microbiological surveillance<sup>d</sup></b>								
Common actions	No action required		<ul style="list-style-type: none"> <li>Review and adjust sample sites and frequency of wastewater to evaluate presence in time and area.</li> <li>Consider adding poliovirus to microbiological testing of all stool specimens in community of detection.<sup>e</sup></li> <li>Consider enhanced surveillance of aseptic meningitis and other clinical syndromes.</li> </ul>					
Key differences		<ul style="list-style-type: none"> <li>Consider targeted healthy children stool sampling</li> </ul>		<ul style="list-style-type: none"> <li>Consider targeted healthy children stool sampling</li> </ul>		<ul style="list-style-type: none"> <li>Consider limited duration environmental surveillance around facility or community of exposed person(s).</li> </ul>		



Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk:	Higher risk:	Higher risk:	Lower risk:	Higher risk:		
	<b>No risk or little risk:</b> Sabin or Sabin-like type 1 or 3 (likely shedding following OPV) <sup>a</sup>	<b>Lower risk:</b> No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	<b>Higher risk:</b> New VDPV, even without evidence of community transmission	<b>Higher risk:</b> Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	<b>Lower risk:</b> Imported case <sup>c</sup>	<b>Higher risk:</b> Community transmission	Risk depends on type of poliovirus detected	<b>Lower risk</b>
<b>Enhanced AFP surveillance</b>								
Common actions	No action required		<p>Actions to improve proportion of cases reported, proportion that have stool samples collected for testing, and timeliness of reporting and follow-up. This may include:</p> <ul style="list-style-type: none"> <li>• communications to clinicians</li> <li>• hospital admission surveillance</li> <li>• community outreach and sensitisation</li> <li>• expanding AFP surveillance to include adults</li> <li>• legal instruments to improve surveillance.</li> </ul>					
<b>Communications (details contained within communications plan)</b>								
Common actions	No action required		<ul style="list-style-type: none"> <li>• Provide key messaging around poliovirus and AFP to public and media.</li> <li>• Promote uptake in vaccinations, with targeted campaigns for communities who may be at greater risk of acquiring poliovirus and/or at greater risk of poorer outcomes.</li> <li>• Provide communications to the health sector, including public health services, clinicians and lab.</li> <li>• Translate all communications into alternative formats and other languages (where possible prepare prior).</li> </ul>					None specifically required



Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk:	Higher risk:	Higher risk:	Lower risk:	Higher risk:		
	<b>No risk or little risk:</b> Sabin or Sabin-like type 1 or 3 (likely shedding following OPV) <sup>a</sup>	<b>Lower risk:</b> No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	<b>Higher risk:</b> New VDPV, even without evidence of community transmission	<b>Higher risk:</b> Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	<b>Lower risk:</b> Imported case <sup>c</sup>	<b>Higher risk:</b> Community transmission	Risk depends on type of poliovirus detected	<b>Lower risk</b>
Key differences			<ul style="list-style-type: none"> <li>Targeted communications in community associated with detection.</li> </ul>		<ul style="list-style-type: none"> <li>Targeted communications in community associated with case.</li> </ul>		<ul style="list-style-type: none"> <li>May need to respond to media attention around this, but important to keep identity of exposed person(s) confidential as possible.</li> </ul>	<ul style="list-style-type: none"> <li>May require response to media attention (if arises) and/or proactive communications to the health sector if enhancing AFP surveillance.</li> </ul>
<b>Immunisation</b>								
Common actions	No action required		<ul style="list-style-type: none"> <li>Increased national campaign plus locally targeted campaigns</li> </ul>					
Key differences				<ul style="list-style-type: none"> <li>Supplementary immunisation activities</li> </ul>		<ul style="list-style-type: none"> <li>Supplementary immunisation activities</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate vaccination of contacts<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>Appropriate vaccination of exposed person with or without vaccination of contacts.</li> </ul>



**Key:** AFP = acute flaccid paralysis; aVDPV = ambiguous vaccine-derived poliovirus; cVDPV = circulating vaccine-derived poliovirus; iVDPV = immune-deficiency associated vaccine-derived poliovirus; OPV = oral poliovirus vaccine; WPV = wild poliovirus.

**Notes:**

- a. The International Health Regulations (IHR) require countries to notify the WHO of all vaccine type 2 viruses (Sabin or Sabin-like).
- b. In strains resembling iVDPV, repeated isolation of the same or a genetically distinct but related virus from the same site does not necessarily indicate an emerging outbreak.
- c. Risk factors for disease include travel to polio-endemic regions or to regions where there are known outbreaks of VDPV.
- d. Enhanced surveillance to be considered in the context of laboratory capacity and capability to ensure feasibility, as well as prioritisation in terms of response.
- e. This should include defining population for testing, with consideration of lab capacity.
- f. Part of case and contact management (see *Communicable Disease Control Manual* for further details<sup>6</sup>).

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<sup>6</sup> Te Whatu Ora. 2023. *Communicable Disease Control Manual*. URL: [tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual](https://www.tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual) (accessed 26 September 2023).



# 1 Introduction

## 1.1 Purpose of this preparedness and response framework

This framework outlines probable scenarios and potential strategic responses that could occur following poliovirus detection in Aotearoa. These scenarios include:

- a case of probable and/or confirmed poliomyelitis (polio) caused by a wild poliovirus (WPV) or by a vaccine-derived poliovirus (VDPV)
- detection in environmental surveillance
- identification of a contact of a known overseas case.

This framework is not intended to provide a definitive course of action for each scenario; rather, it is a 'toolkit' identifying key components that will be required in a response and suggested approaches to these.

In the case of any of these scenarios a risk assessment involving key relevant agencies and stakeholders would be triggered prior to any of these responses being undertaken, to allow for decision making tailored to the specific context at the time of this occurrence. National coordination will be established using existing mechanisms, with establishment of advisory groups and/or utilisation of existing expert clinical groups as required (eg, the National Certification Committee for the Eradication of Polio (NCCEP) and the New Zealand Microbiology Network).

This high-level framework allows for flexibility in regional and local level responses that will be led by operational agencies in partnership with Māori (including relevant health organisations such as Te Aka Whai Ora and Iwi Māori Partnership Boards (IMPBs)). It complements the 'Poliomyelitis' chapter of the Te Whatu Ora *Communicable Disease Control Manual*,<sup>7</sup> which provides more detailed operational guidance for public health services.

An operational response to polio will need to have full regard for the geographic and local context, including sociodemographic and immunisation profiles of the population. Furthermore, we need to ensure that the operational response is equity based, Te Tiriti o Waitangi compliant, and ensures that Māori, Pacific and disabled populations are protected, as well as other populations that may be at higher risk of acquiring polio and/or of poorer outcomes.

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<sup>7</sup> Te Whatu Ora. 2023. *Poliomyelitis — Part of the Communicable Disease Control Manual*. URL: [tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual/poliomyelitis](https://www.tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual/poliomyelitis) (accessed 26 September 2023).



## 1.2 Aims and aspirations

### 1. *To fulfil our global commitment to polio eradication*

Aotearoa is committed to remaining free of circulating polio, as well as supporting ongoing efforts in the global eradication of polio. This commitment remains despite the impacts of the COVID-19 pandemic on these efforts, which may be reflected through recent VDPV outbreaks in high-income countries as well as countries within the Asia-Pacific region. Aotearoa also has experienced disruptions to essential health services, including childhood immunisations, during the COVID-19 pandemic. Since areas with sub-optimal immunisation levels exist, there is the possibility of transmission should a poliovirus be introduced, which demonstrates the importance of preparedness work, as well as ongoing work improving routine vaccination coverage.

### 2. *To strengthen integrated surveillance and response systems for poliovirus and other vaccine-preventable diseases*

Aotearoa supports international strategic aims to integrate systems for surveillance and other preparedness and response actions across vaccine-preventable diseases, including our aims to strengthen surveillance systems for polio, such as through environmental testing and improving the sensitivity of acute flaccid paralysis (AFP) surveillance. We also aim to boost coverage of all childhood vaccinations, rather than focusing on vaccinating for individual diseases, to better utilise our health care workers as well as being better for whānau.

### 3. *To support poliovirus preparedness and response work in our neighbouring Pacific countries, and protect the Pacific from incursions of poliovirus from Aotearoa*

Aotearoa has been declared polio free, with the last case occurring in 1977. If, however, there was an outbreak in Aotearoa, health agencies are committed to mitigating the risk of spread to our Pacific neighbours. We also are committed to capacity building across the Asia-Pacific region and continue our participation in the World Health Organization's (WHO) regional forums to share information and knowledge.

## 1.3 Global and local situation

### 1.3.1 International situation

WPV is endemic in two countries: Afghanistan and Pakistan. However, there are ongoing outbreaks in countries that have experienced re-infection either through importation of WPV or VDPV from another country, or the emergence and circulation of VDPV.

In 2022, the WHO advised of an increase in polio activity in areas that have previously seen eradication. This includes detection of circulating vaccine-derived polio in New York (a confirmed case of paralytic polio and widespread wastewater detection), Israel (multiple confirmed cases of paralytic and non-paralytic polio and ongoing wastewater detections), London (wastewater detections), and Canada (wastewater detection).



Affected countries have responded by launching appropriate vaccination campaigns and responses.

For the most up-to-date information, please see the 'Outbreak Countries' webpage on the Global Polio Eradication Initiative website ([polioeradication.org/where-we-work/polio-outbreak-countries](https://polioeradication.org/where-we-work/polio-outbreak-countries)).

## 1.3.2 Aotearoa and Western Pacific Region

### 1.3.2.1 Historical context

The last case of WPV in Aotearoa was in 1977, and the WHO Western Pacific Region has been declared polio free since 2000. Although vaccine-associated paralytic polio (VAPP) has been documented in Aotearoa after 1977, no cases have occurred since the inactivated polio vaccine (IPV) was introduced in 2002. The last case of imported WPV was in 1976 in a child from Tonga.

In Aotearoa vaccine coverage at age 12 months had been over 85% since 2009, and in the 12-month period to the end of June 2018, 93% of children were fully immunised (including three doses of IPV) by 12 months of age. However, both internationally and in Aotearoa rates have declined in the context of COVID-19.

### 1.3.2.2 Current immunisation coverage

Most countries consider >90% to be acceptable to achieve herd immunity for poliovirus infection, although it is likely that herd immunity could be achieved at lower rates (eg, approximately 80%). However, it is important to note that transmission in people immunised with IPV is possible, and that herd immunity depends on other factors, such as the level of sanitation and crowding, which affect  $R_v$  (reproduction number in vaccinated people). As an example, transmission occurred in Israel despite very high vaccination rates (approximately 98–99% in 2021). Due to this, and because poliovirus vaccination is delivered alongside other childhood vaccines that need higher coverage for herd immunity, we continue to promote 95% coverage for polio vaccination.

Currently some districts have immunisation rates <80%, and there are significant inequities for Māori populations, as well as a lack of data for disabled tamariki, which means that there is an increased risk that if poliovirus was introduced into Aotearoa it could spread amongst pockets of under-immunised people, particularly of tamariki Māori. This has significant implications for priorities of equity and partnership with Māori under the reformed health system, and under our obligations to Te Tiriti.

### 1.3.2.3 Te Tiriti o Waitangi

Aotearoa has the following specific responsibilities under Te Tiriti o Waitangi that we must apply in our polio preparedness and response.



<b>Tino rangatiratanga</b>	The guarantee of tino rangatiratanga, which provides for Māori self-determination and mana motuhake in the design, delivery, and monitoring of health and disability services.	<ul style="list-style-type: none"> <li>• Providing for Māori self-determination and mana motuhake in the design, delivery, and monitoring of Aotearoa New Zealand's polio response.</li> <li>• Consumer and whānau rights are to be respected and should be enabled to be exercised throughout any response to an outbreak or health emergency.<sup>8</sup></li> <li>• Iwi Māori have a role in decision making in the design, delivery, prioritisation, and monitoring of the response.</li> </ul>
<b>Equity</b>	The principle of equity, which requires the Crown to commit to achieving equitable health outcomes for Māori.	<ul style="list-style-type: none"> <li>• Achieving equitable outcomes in terms of polio for Māori, relating to both acquisition and prevention of severe disease/outcomes from polio. All efforts must be made to ensure equity is at the forefront of decision making.</li> <li>• Equity requires a focus on differentiated access, treatment, and resources to achieve equitable health outcomes related to polio and other communicable disease outbreaks for Māori.</li> <li>• An equity approach would consider how resources can be allocated to mitigate the adverse consequences of a polio outbreak and avoid or minimise growth in inequity deriving from the measures implemented.</li> <li>• The response should not cause long-lasting negative impacts for Māori, including inter-generational impacts, that exacerbate inequities.</li> </ul>
<b>Options</b>	The principle of options, which requires the Crown to provide for and properly resource kaupapa Māori health and disability services. Furthermore, the Crown is obliged to ensure that all health and disability services are provided in a culturally appropriate way that recognises and supports the expression of hauora Māori models of care.	<ul style="list-style-type: none"> <li>• Prioritise providing kaupapa Māori health and disability services in respect to polio preparedness and response, which may include kaupapa Māori providers and groups in case and contact management, and vaccination.</li> <li>• Supporting these providers requires a shift to high trust funding arrangements and the devolution of power, decision making, and resources, including funding to meet community needs in a more efficient and timely way.</li> </ul>

<sup>8</sup> For further information, see the Code of Health and Disability Services Consumers' Rights, the New Zealand Bill of Rights Act 1990, and the Human Rights Act 1993.





<b>Partnership</b>	The principle of partnership, which requires the Crown and Māori to work in partnership in the governance, design, delivery and monitoring of health and disability services. Māori must be co-designers, with the Crown, of the primary health system for Māori.	<ul style="list-style-type: none"> <li>• The Crown and its agencies work alongside Māori to enable a coordinated and united response to a polio outbreak.</li> <li>• Māori to work in partnership in the governance, funding, design, delivery, and monitoring of this polio readiness work.</li> <li>• Māori leadership and decision making is enabled by continuing to resource Māori communities to lead aspects of the polio response.</li> <li>• Partnership is enabled by coordinated Crown cross-agency response and good information-sharing practices across all groups involved in the response.</li> </ul>
<b>Active protection</b>	The principle of active protection, which requires the Crown to act, to the fullest extent practicable, to achieve equitable health outcomes for Māori. This includes ensuring that it, its agents, and its Treaty partner are well informed on the extent, and nature, of both Māori health outcomes and efforts to achieve Māori health equity.	<ul style="list-style-type: none"> <li>• Ensuring that we act to the fullest extent to address risks to achieve equitable health outcomes in the event of a polio outbreak, including addressing current low childhood immunisation rates for tamariki Māori.</li> <li>• Decisions and resources should actively protect the health of the Māori population and equip whānau, hapū, iwi and Māori communities to undertake and respond to public health measures to prevent and/or manage the spread and transmission of disease among their people.</li> <li>• The health and disability system should collect high-quality ethnicity data to monitor existing inequities and specific risks posed by polio, including ensuring visibility of groups of Māori such as tāngata whaikaha Māori in our data collection related to polio preparedness (including immunisation data).</li> <li>• Timely and comprehensive intelligence and data should be shared openly with Māori to inform Māori responses and considering Māori data sovereignty applications and implications.</li> </ul>

### 1.3.2.4 Equity

Under the Pae Ora (Healthy Futures) Act 2022 we are committed to achieve equity in health outcomes for all, and the Pae Ora strategies set the direction for an equitable, accessible, cohesive and people-centred system, including for specific populations who may experience inequities in health and wellbeing outcomes, including:



- Māori
- Pacific peoples
- disabled people
- rural populations
- women.

We also have commitments to relevant United Nations resolutions and treaties, including:

- Declaration on the Rights of Indigenous Peoples
- Convention on the Rights of Persons with Disabilities<sup>9</sup>
- Convention on the Rights of the Child
- Convention on the Elimination of All Forms of Discrimination Against Women.

Inequitable health and wellbeing outcomes may be associated with **poorer access to health services and/or the increased impact of public health measures** (eg, economic impact of quarantine). Therefore other groups to be considered at risk of poorer outcomes include socio-economically disadvantaged populations, ethnic minority groups, those who are unenrolled with primary care, and Recognised Seasonal Employer (RSE) workers.

We can address inequities with a Te Tiriti and equity-first approach that needs to involve anticipating and responding to the specific needs of different populations. It also requires the ability to accurately identify and monitor equity through better data collection and disaggregation.

**Example:**

For disabled people, identifying additional health needs early in the response should include engagement with disabled people’s organisations (such as Whaikaha | Ministry of Disabled People) and non-governmental organisations to support distribution of accessible health-related information out to their members and communities. We also need to improve recording of disability status in our data collection to better monitor outcomes for this group.

*We acknowledge those living with disability as a result of previous polio, which highlights the importance of good communication with disabled people throughout the preparedness cycle.*

There are also groups that may have a **higher risk of acquisition/exposure, transmission** and/or **severe clinical disease**. Migrant/refugee communities may have countries of origin where polio is endemic or there is circulating VDPV, and therefore may theoretically have a **higher risk of exposure** to polio. However, despite this risk

<sup>9</sup> Article 25 of the Disability Convention recognises that disabled people have the right to enjoy the highest attainable standard of health without discrimination on the basis of disability.



many of these communities may be well-vaccinated, particularly due to resettlement processes coming to Aotearoa.

**Groups at higher risk of transmission** include those who:

- have attended a high-risk setting
- are immunocompromised
- are in high-risk occupations, such as food handlers, health care workers, early childhood education teachers, and carers.

We should pay specific attention to our response in high-risk settings such as emergency and shared accommodation/residential facilities, and specialist schools or facilities. We should also consider specific characteristics of other settings that increase risk of transmission, including poor sanitation or overcrowding — for example, the impact of Cyclone Gabrielle in 2023 on isolated communities in Tairāwhiti, where there has been disruption of essential infrastructure and health services, damage to housing and displacement of whānau.

Those at higher risk of **severe clinical disease** (paralysis and increased mortality) include anyone who is not fully vaccinated either with oral polio vaccine (OPV) or IPV, particularly those who are unvaccinated and are adolescents or adults and/or immunocompromised. Pregnant women may also experience severe disease and have a higher risk of miscarriage.

Please note that further detail and guidance for public health services managing cases and contacts at higher risk of transmission or higher risk of clinical severe disease is provided in the *Communicable Disease Control Manual* Chapter.

We also are committed to reduce risk of importation of disease to our neighbouring Pacific countries should there be evidence of transmission, or a case be detected in Aotearoa. Additionally, we will support our Pacific neighbours and especially our Realm countries to achieve and maintain high vaccination coverage to try and prevent spread of this disease.

## 1.4 Existing surveillance

Currently in Aotearoa we have AFP surveillance as well as environmental (wastewater) surveillance.

### 1.4.1 Acute flaccid paralysis surveillance

AFP surveillance is undertaken by the New Zealand Paediatric Surveillance Unit (NZPSU). The purpose of it is to demonstrate that we have a surveillance system that would be able to detect polio cases, and it is part of the polio eradication strategy. AFP surveillance is also critical for documenting the absence of poliovirus circulation for certification of eradication. Certification of polio-free status requires the absence of WPV transmission from any source (AFP, sewage samples, community samples) for at



least three successive years together with timely and sensitive AFP surveillance that meets Global Certification Commission certification standards.<sup>10</sup> The NZPSU notifies all paediatric AFP cases nationally for awareness.

AFP surveillance currently sits outside of the notifiable disease system. Polio, however, is a notifiable disease and therefore under the Health Act 1956. Attending health practitioners are required to notify their local medical officer of health of any suspected or diagnosed cases of this.

AFP is a clinical description of sudden onset of muscle weakness without any spasticity or rigidity. The most common medical conditions resulting in AFP are Guillain-Barré syndrome and transverse myelitis.

AFP surveillance only includes children under 15 years of age, as polio cases in older people are extremely rare, although individuals of any age (especially those who are immunocompromised) may develop the disease. The most recent US case earlier in 2022 was an unvaccinated young adult in his twenties.

To confirm the absence of polio, the WHO requires a surveillance system to be in place:

- that captures an annual incidence of AFP, not due to polio, of at least one per 100,000 children aged under 15 years
- in which 80% of cases of AFP have two stool samples taken at least 24 hours apart within 14 days of onset, tested negative for WPV in a WHO-accredited laboratory.

#### 1.4.1.1 AFP indicators in Aotearoa

Although the WHO target for capture of AFP (incidence rate of 1/100,000 in children under 15 years of age) was reached from 2019 to 2022,<sup>11</sup> the rate of the required stool testing was below the WHO target of 80% (around 50–70%).

About 80% of paediatricians are participating in NZPSU surveillance. Their average monthly response rate remains at around 70%. As this would indicate an overall coverage rate of about 56%, it would be appropriate to make sure that AFP surveillance covers paediatric hubs where most cases of AFP in Aotearoa will be treated (Starship Children's Hospital in particular) and/or to improve the coverage.

## 1.4.2 Environmental (wastewater) surveillance

As an infected person is much more likely to be asymptomatic than symptomatic, and because AFP is an uncommon (but severe) outcome of poliovirus infection, poliovirus circulation may be more effectively detected by environmental surveillance compared to AFP surveillance.

Environmental (wastewater) surveillance for poliovirus re-commenced in Aotearoa in January 2023.

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<sup>10</sup> World Health Organization. 2018. *Polio* — *Vaccine-Preventable Diseases, Surveillance Standards*. URL: [who.int/publications/m/item/vaccine-preventable-diseases-surveillance-standards-polio](https://www.who.int/publications/m/item/vaccine-preventable-diseases-surveillance-standards-polio) (accessed 26 September 2023).

<sup>11</sup> See 'Annual reports of the New Zealand Paediatric Surveillance Unit' at [otago.ac.nz/nzpsu/reports](https://otago.ac.nz/nzpsu/reports)



Samples for poliovirus testing, using both cell culture and direct polymerase chain reaction (PCR), will be collected from selected sites at least once a month. The sites and frequency of testing will be reviewed every six months and can be increased if necessary during a response to a detection.

Any detection of poliovirus — including Sabin/Sabin-like poliovirus, WPV, VDPV or indeterminate — will be reported nationally.

All detections **other** than Sabin/Sabin-like type 1 or 3 viruses will trigger a national response and risk assessment. National coordination and response activities are described in more detail in section 3.2).

## 1.5 Other surveillance mechanisms

The following list shows additional surveillance mechanisms/strategies that could be implemented in response to WPV or VDPV importation, or if there was concern of transmission in Aotearoa, in addition to existing surveillance. Any decisions about additional surveillance will require discussion and assessment by key decision-makers in the response, alongside other advisory groups and relevant parties such as ESR, the New Zealand Microbiology Network, laboratories and clinicians around the *need* for further surveillance. Any additional surveillance should have a clear purpose and have been considered from a cost–benefit perspective (including use of existing capability and capacity) and in terms of feasibility (ie, whether there is adequate capacity to perform additional testing).

### 1.5.1 Enhanced microbiological surveillance

In response to a change in the polio risk in Aotearoa, the following enhancements in microbiological surveillance will be considered.

- **Targeted/enhanced environmental surveillance**

Environmental surveillance may be enhanced to increase sensitivity and specificity of detection of community transmission. This enhanced environmental surveillance may focus on a particular area or a particular period (including retrospective testing) or both.

- **Enhanced surveillance of enterovirus meningitis and other neurological syndromes**

To supplement AFP surveillance, enhanced surveillance of aseptic meningitis and other clinical syndromes could be considered, which may include submission of enterovirus positive cerebrospinal fluid (CSF) samples and positive nucleic acid extracts. However, noting that poliovirus detection in CSF is poor, and although enteroviruses are picked up by routine PCR tests during the workup of encephalomyelitis cases, it may be more useful to focus on stool testing for these cases.



There could also be consideration of systematic stool sampling of all acute neurological illnesses (including meningitis).

- **Adding poliovirus testing to microbiological testing of all stool specimens in community of detection**

In a situation where there is concern around community transmission (eg, sustained detection in wastewater or detection of poliovirus in an AFP case without risk factors for disease such as travel), addition of poliovirus testing to enterovirus PCR positive stool specimens in a specified area will be considered.

Any decision would take into account lab and clinical capability and capacity, and there will need to be prioritisation of enhanced surveillance methods depending on available resources.

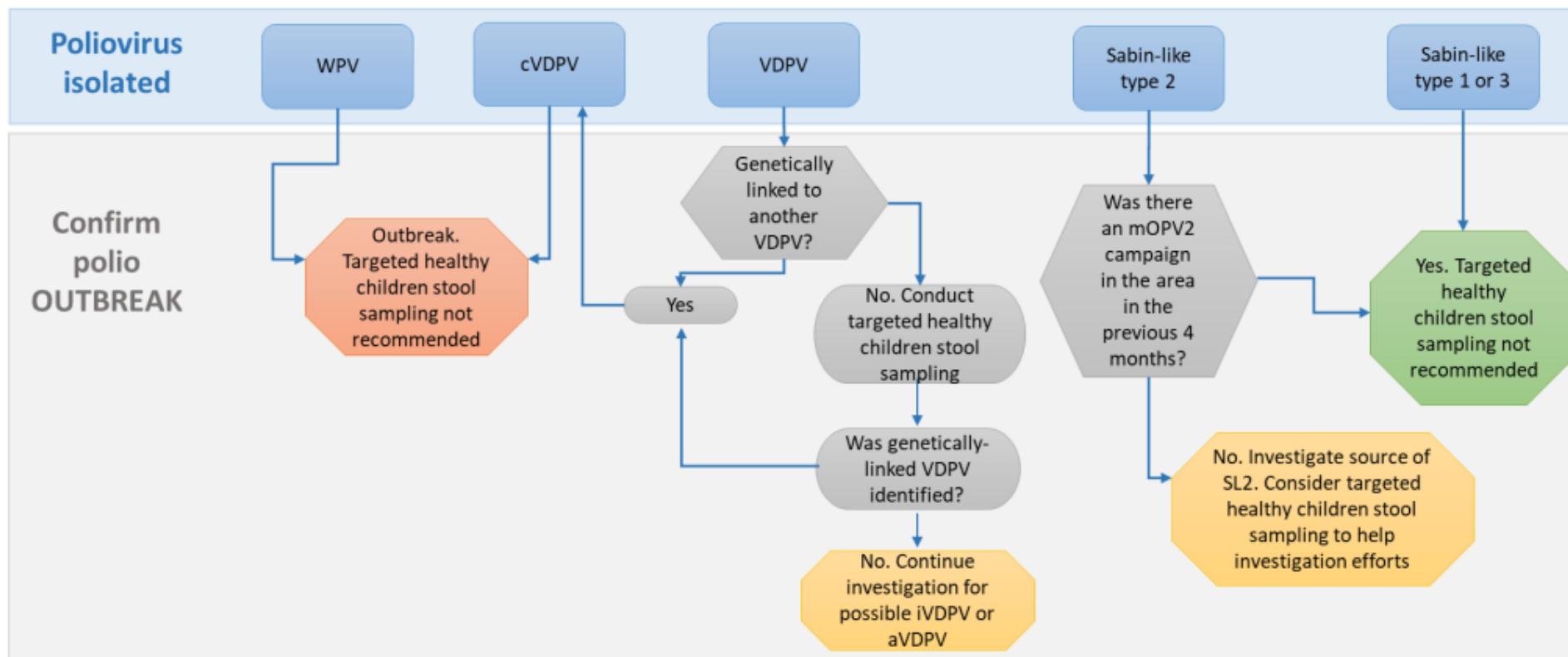
- **Targeted healthy children stool sampling** (also known as healthy children sampling, community contact sampling, community stool sampling, or asymptomatic children stool sampling)

Stool sampling in healthy children would be considered following a new VDPV isolation when community transmission **has not** been confirmed but where transmission in this community is possible and community poliovirus transmission status is unclear. The community for this sampling should be well defined.

The decision to conduct targeted healthy children stool sampling must be made in close coordination with national surveillance and laboratory teams. It is recommended by the WHO/Polio Global Eradication Initiative to collect one stool specimen from each of 20 asymptomatic children (ie, children without AFP) to determine if poliovirus is present and hence transmission in the community. This should only be conducted after confirmation that a VDPV is not genetically linked to another VDPV (see Figure 1). Cultural safety considerations must be applied to stool sampling (see *Communicable Disease Control Manual* for further details).



Figure 1: Flow chart for assessing situations for targeted healthy children stool sampling<sup>12</sup>



If there is already evidence of community-wide transmission, targeted healthy children stool samplings should not be conducted.

<sup>12</sup> Source: Polio Global Eradication Initiative. 2020. *Job aid: Use of AFP contact sampling and targeted healthy children stool sampling*. URL: [polioeradication.org/wp-content/uploads/2020/03/AFP-contact-sampling-and-targeted-healthy-children-stool-sampling-20200327.pdf](https://polioeradication.org/wp-content/uploads/2020/03/AFP-contact-sampling-and-targeted-healthy-children-stool-sampling-20200327.pdf) (accessed 26 September 2023).



## 1.5.2 Enhanced clinical surveillance

In response to increased polio risk in Aotearoa there would be enhanced active case finding to improve proportion of cases reported, proportion that have stool samples collected for testing and timeliness of reporting and follow-up. These actions may include:

- communications to the health sector and clinicians regarding polio and/or potential for AFP diagnoses, particularly hospitals and paediatricians
- hospital admission surveillance (retrospective case searches/6-month record reviews for undetected/unreported AFP cases, and investigating unreported AFP cases)
- community outreach and sensitisation, including awareness around polio and/or AFP symptoms
- expanding AFP surveillance to include adults
- legal instruments to improve surveillance (ie, making AFP notifiable).

# 1.6 Potential scenarios for poliovirus importation or circulation in Aotearoa

This framework describes four key scenarios and corresponding potential approaches, noting that these have been identified as likely or important scenarios to prepare for, but are not an exhaustive list. These scenarios would trigger a risk assessment that would feed into subsequent decision making about definitive actions.

The four scenarios are:

- detection of poliovirus through environmental surveillance
- detection of poliovirus in a person with AFP
- facility-related exposure to live polioviruses
- known contact of an overseas polio case.

Responses to these scenarios are described later in this framework (see chapter 3). Critically, detection of either WPV or VDPV from an environmental specimen and/or detection in a case of AFP requires determination of whether the results represent recent importation of circulating poliovirus in the community (community transmission).

We note that there are a variety of mechanisms for how poliovirus could be imported to Aotearoa, including the importation of:

- VDPV following travel to an area where the virus is known to be circulating
- a case of VAPP from a country using OPV
- WPV from a country with recent cases of non-endemic polio.





# 2 Background

## 2.1 Clinical description of polio

Poliomyelitis (polio) is currently caused by wild poliovirus type 1 (WPV1) or by live vaccine-derived polioviruses (VDPVs). The WHO declared wild poliovirus type 2 (WPV2) eradicated in 2015, and wild poliovirus type 3 (WPV3) eradicated in 2019.

Infection is established in the gastrointestinal tract. A minor illness occurs in about 10–25% of infections, and symptoms may include fever, headache, sore throat, gastrointestinal disturbances, malaise, neck and back stiffness, and pain in the limbs, back and neck.

Severe symptoms occur in 1–2% of infected unvaccinated individuals. AFP occurs in 0.5–0.05% of infected individuals, and is more common in adults, where the incidence may be as high as 1 in every 75 infections.<sup>13</sup> Severe illness often includes aseptic meningitis, which can precede development of paralysis.<sup>14</sup>

### What is Acute Flaccid Paralysis (AFP)?

AFP 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.<sup>15</sup>

The term 'flaccid' indicates the absence of spasticity or other signs of disordered central nervous system motor tracts such as hyperreflexia, clonus, or extensor plantar responses.

For details on laboratory testing and case classification, please see the Te Whatu Ora *Communicable Disease Control Manual*.<sup>16</sup>

As per section 1.4.1, polio is a notifiable disease, and the attending health practitioner must notify Medical Officers of Health on suspicion (prior to confirmation via testing).

<sup>13</sup> Ministry of Health. 2023. *Immunisation Handbook 2020*. URL: <https://www.health.govt.nz/our-work/immunisation-handbook-2020> (accessed 26 September 2023).

<sup>14</sup> Simionescu L, Modlin JF. 2023. *Poliomyelitis and Post-Polio Syndrome*. URL: [uptodate.com/contents/poliomyelitis-and-post-polio-syndrome](https://uptodate.com/contents/poliomyelitis-and-post-polio-syndrome) (accessed 26 September 2023).

<sup>15</sup> Leonardi M, Sartorius N, Hull HF et al. 1993. *Acute Onset Flaccid Paralysis*. WHO/MNH/EPI/93.3. URL: [iris.who.int/handle/10665/61626](https://iris.who.int/handle/10665/61626) (accessed 26 September 2023).

<sup>16</sup> Te Whatu Ora. 2023. *Communicable Disease Control Manual*. URL: [tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual](https://www.tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual) (accessed 26 September 2023).



## 2.2 The spread of poliovirus

For the most recent information regarding the spread of poliovirus based on emerging evidence, please see the *Communicable Disease Control Manual*.

## 2.3 WHO definitions of polio events and outbreaks

**Outbreak**<sup>17</sup> means detection of WPV or circulating vaccine-derived poliovirus (cVDPV) with community-level transmission as demonstrated by:

- detection in a human, unless there is a travel history to an infected area with 35 days before onset of paralysis or a confirmed type-specific virus exposure in a laboratory or vaccine production facility
- two separate detections from the environment, where separate means the samples were collected from two different sites with no overlapping catchment areas or from the same site but at least two months apart
- any newly detected cVDPV, whether in a human or environmental sample; that is, when a VDPV isolated either in human stool or the environment can immediately be genetically linked to another VDPV thereby confirming circulation in the areas of detection.

**Importation event**<sup>17</sup> means detection of WPV or cVDPV importation but no evidence of community transmission — for example:

- detection of WPV or known cVDPV in an AFP case or asymptomatic person with a travel history to an infected area within the 351 days before onset of illness
- one single environmental detection of WPV or a known cVDPV in a new infected territory (or country), with no evidence of local community transmission found
- multiple environmental detections of WPV or a known cVDPV from one site over less than two months but no evidence of ongoing viral replication (isolates are genetically identical or nearly identical).

**A new emergence event: New VDPV emergence** means:

- detection of a newly identified VDPV in a single AFP case or asymptomatic person (such as a household contact) with no evidence of community transmission found, including from genetic sequencing (not genetically linked to another known VDPV)
- multiple detections of a newly identified VDPVs from a single environmental sampling site within a two-month period but no virological evidence of multiple excretors (ie, the genetic sequences are identical or nearly identical).

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<sup>17</sup> World Health Organization. 2022. *Standard Operating Procedures: Responding to a Poliovirus Event or Outbreak* (version 4.1). URL:

<https://apps.who.int/iris/bitstream/handle/10665/363627/9789240049154-eng.pdf> (accessed 26 September 2023).



**Facility associated WPV or VDPV event** means detection of WPV or VDPV in a person with suspected or documented type-specific virus exposure in a laboratory or vaccine production facility, or in the environment samples collected in the vicinity of such a facility.

## 2.4 Polio vaccines in Aotearoa and internationally

### 2.4.1 Introduction to polio vaccines

#### 2.4.1.1 Inactivated poliovirus vaccine

Inactivated poliovirus vaccine (IPV) protects people against all three types of polioviruses. IPV does not contain live virus, so people who receive this vaccine do not shed the virus and cannot infect others, and the vaccine cannot cause disease. Therefore, an increasing number of industrialised, polio-free countries are using IPV as the vaccine of choice.

Aotearoa uses IPV in combination vaccines for routine childhood vaccination.

#### 2.4.1.2 Oral polio vaccine

OPV is used in many countries to protect against polio disease and has been essential to the eradication effort as it is inexpensive, safe and effective, and easy to administer. There are different types of OPV, which may contain one, a combination of two, or all three different types of attenuated, or weakened, vaccine. Each has their own advantages and disadvantages over the others.

After WPV2 was declared eradicated in 2015, the world switched from trivalent OPV (tOPV), which contains all three types of polioviruses, to bivalent OPV (bOPV), which only contains poliovirus types 1 and 3. As a result, tOPV has not been used since 2016. This means that individuals in countries where OPV is the only vaccine used will not be protected against cVDPV type 2 (cVDPV2).

Though rare, when there is insufficient coverage in a community, the vaccine virus may be able to circulate and over the course of 12 to 18 months mutate into a VDPV capable of causing paralysis.

OPV stimulates good mucosal immunity, and therefore is effective at interrupting transmission of the virus. OPV is therefore used wherever a polio outbreak needs to be contained, even in countries that rely exclusively on IPV for their routine immunisation programme, such as Aotearoa. For several weeks after vaccination with OPV the vaccine virus replicates in the intestine and is excreted. This may result in 'passive' immunisation of people who have not been vaccinated, but it may also create potential for positive detection in wastewater without signifying community transmission.

After WPV2 was declared eradicated in 2015, the world switched from tOPV to bOPV.



### 2.4.1.3 nOPV2

The novel oral polio vaccine type 2 (nOPV2) is a modified version of the existing monovalent OPV type 2 (mOPV2). Clinical trials have shown nOPV2 provides comparable protection against poliovirus while being more genetically stable and less likely to revert into a form that can cause paralysis. The vaccine's increased genetic stability means there is a reduced risk of seeding new cVDPV2 emergences compared to mOPV2.

Please see the Manatū Hauora *Immunisation Handbook 2020*<sup>18</sup> for the latest information regarding polio vaccines.

## 2.4.2 Available vaccines in Aotearoa

### 2.4.2.1 Funded polio vaccines

The following polio-containing vaccines are funded as part of the Schedule in Aotearoa:

- **DTaP-IPV-HepB/Hib (Infanrix-hexa, GSK):** diphtheria, tetanus, acellular pertussis, inactivated polio, hepatitis B and *Haemophilus influenzae* type b vaccine (see section 6.4.1 of the *Immunisation Handbook 2020* for more information)
- **DTaP-IPV (Infanrix-IPV, GSK):** diphtheria, tetanus, acellular pertussis and IPV (see section 6.4.1 of the *Immunisation Handbook 2020* for more information)
- **IPV (IPOL, Sanofi):** contains three strains of poliovirus (40D antigen units of the Mahoney, 8D antigen units of the MEF-1 and 32D antigen units of the Saukett strains), inactivated by formaldehyde and containing phenoxyethanol as a preservative; trace amounts of neomycin, streptomycin, polymyxin B, polysorbate 80 and bovine serum albumin may be present.

### 2.4.2.2 Other vaccine

**Adacel Polio (Sanofi)** is a Tdap-IPV vaccine registered (approved for use) and available (marketed) in Aotearoa.

## 2.4.3 Aotearoa's childhood immunisation schedule

The Aotearoa immunisation schedule involves a course of four doses of IPV given at six weeks, three months, five months and four years using **INFANRIX®-hexa** (a hexavalent vaccine containing DTaP-IPV-HepB/Hib) for the first three doses, and **INFANRIX™-IPV** (a tetravalent vaccine containing DTaP-IPV) for the fourth dose. Further information is available in the *Immunisation Handbook 2020*. This is recommended as part of routine childhood vaccination, not in the case of response to a polio outbreak.

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<sup>18</sup> Ministry of Health. 2023. *Immunisation Handbook 2020*. URL: <https://www.health.govt.nz/our-work/immunisation-handbook-2020> (accessed 26 September 2023).



## 2.5 Principles for current vaccination preparedness in Aotearoa

In Aotearoa polio vaccines are promoted alongside other childhood immunisations, which is facilitated by IPV being administered in a combination vaccine as per the Aotearoa immunisation schedule. There are currently increased efforts in Aotearoa to boost childhood immunisations for the general population as well as more targeted efforts for specific groups that have lower vaccination coverage (particularly due to disruptions associated with COVID-19) and/or where populations are at higher risk of severe outcomes from vaccine-preventable diseases. Within this context the principles for current polio vaccination preparedness are as follows:

- Currently, vaccine coverage is on average 82.9% at 2 years of age in 2022, but in some areas it is as low as 38% in Māori tamariki living in low socio-economic areas. Preferably we should aim for 95% coverage for polio vaccination given that there have been examples where outbreaks have occurred despite high coverage (see section 1.3.2.2).
- We must identify populations at higher risk of exposure and ensure optimal vaccine uptake. This is likely to include migrants and refugees; noting, however, that this group is often well-vaccinated.
- We must identify pockets of low coverage. There may be groups who are at greater risk of being under-immunised, including:<sup>19</sup>
  - Māori
  - people living in areas of deprivation
  - people who are historically under-immunised, including the vaccine hesitant.

Overlaying areas of low coverage with areas of high risk for either exposure or acquisition, or for poor outcomes, can help with prioritisation for targeted vaccination both as part of general preparedness and in response to scenarios where there are concerns or evidence that there may be circulating poliovirus. Geographical and sociodemographic analysis of vaccination coverage is ongoing.

More detail around vaccination strategies for these situations are described in chapter 3.

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<sup>19</sup> As of time of publication.

# 3 Key poliovirus importation or circulation scenarios and corresponding actions

All poliovirus detection events will trigger a:

- **public health investigation**, including of cases and their contacts, and local communities, or in the case of a positive environmental sample, investigation of the catchment area and population being sampled by the surveillance site
- **risk assessment**.

This investigation and corresponding risk assessment will then inform other key responses including:

- **enhanced surveillance**
- **communications**
- **immunisation**.

The most likely scenario that might occur in Aotearoa is detection of poliovirus in an environmental sample (wastewater). Less likely, but important to plan for, is a case of poliomyelitis (polio) caused by a wild poliovirus (WPV) or by a vaccine-derived poliovirus (VDPV). We have also planned for a response following identification of a contact of a known case overseas, and facility-related exposure to live polioviruses.

These are described in this chapter, noting there is a separate detailed communication plan.

A summary table of scenarios and responses is provided in section 3.6.

There is separate information for cases and contacts found in the *Communicable Disease Control Manual*. In consultation with regional public health services, the national office is preparing supporting operational documents for use in an outbreak.



## 3.1 Notification and obligations under the IHR

Under the International Health Regulations (IHR), countries must notify the WHO for all events that may constitute a Public Health Emergency of International Concern. For polio, this includes detection in human or non-human sources of:

- WPV
- VDPV (type 1, 2 or 3)
- and Sabin/Sabin-like type 2 viruses, from the areas where Sabin oral poliovirus vaccine type 2 (OPV2) has not been used in the previous four months (Sabin/Sabin-like virus types 1 and 3 are not notifiable).

The national IHR focal point must notify the WHO within 24 hours; specifically the IHR contact person at the respective WHO regional office, and without waiting for final classification.

In addition, Aotearoa must investigate any poliovirus isolate notifiable under the IHR, from any human or environmental sources, and the Global Polio Eradication Initiative can support as required.

There is also guidance around spills, releases or breaches (without known or demonstrated human transmission or environmental contamination).

Because WPV2 has been eradicated, OPV2 has been withdrawn and all WPV2 is currently being targeted for destruction, transfer or containment in a secure poliovirus-essential facility. Any poliovirus type 2 exposure or breach (any virus belonging to poliovirus type 2, including VDPV2 and WPV2) should be regarded as a notifiable event and notified to the WHO regional contact.

Spills or releases involving WPV/VDPV types 1 or 3 should also be notified (as per Annex 2 of the IHR) if the event meets at least two of the following criteria:

- the event's public health impact is serious
- the event is unusual or unexpected
- the risk of international spread is significant
- the risk of international travel or trade restrictions is significant.

In general, any containment breach involving WPV/VDPV types 1 or 3 should also be notified to the WHO. When a facility identified a breach, it is the facility management's responsibility to inform Manatū Hauora (within 24 hours). It is then the responsibility of Manatū Hauora to notify the WHO.

Currently, as the global polio situation is a Public Health Emergency of International Concern, the Emergency Committee on polio under the IHR issues temporary



recommendations every three months for polio, which will continue to be reviewed by Aotearoa.<sup>20</sup>

## 3.2 Detection in environment (wastewater testing)

Once environmental (wastewater) testing is initiated, initial identification will indicate the presence of:

- Sabin-like poliovirus vaccine strains (1, 2 and 3)
- non-Sabin viruses VDPV and WPV. This detection will then be verified by sequencing. Sequencing can also identify if a VDPV is new or if it is a circulating vaccine-derived poliovirus (cVDPV), ambiguous vaccine-derived poliovirus (aVDPV), or immune-deficiency associated vaccine-derived poliovirus (iVDPV). Some indeterminate and invalid results will also be sequenced.

Detection of Sabin/Sabin-like poliovirus (types 1 and 3) requires reporting nationally.

Detection of Sabin/Sabin-like type 2 viruses requires national notification and risk assessment (as per the WHO).

Detection of non-Sabin viruses VDPV and WPV is likely to warrant an **urgent nationally coordinated response**. Actions subsequently required may include:

- public health investigation
- risk assessment
- vaccination response.

While not essential for identification purposes (eg, whether it is one of the above strains), poliovirus isolate/s may also be sent to the WHO Reference Laboratory for further sequencing that may be necessary to determine whether a VDPV is cVDPV, aVDPV, or iVDPV using epidemiological/molecular timelines. Please see Appendix 1 for wastewater testing timeframes, noting that these times are subject to change depending on method of testing (eg, direct polymerase chain reaction (PCR)).

The response required may differ depending on the type of virus detected, and whether there has been a single detection or sustained detection of polio.

### 3.2.1 Sabin/Sabin-like viruses (types 1 and 3)

A detection of Sabin/Sabin-like virus is likely to be due to excretion by people who have recently received an OPV.

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<sup>20</sup> See 'Public Health Emergency status' at [polioeradication.org/polio-today/polio-now/public-health-emergency-status](https://polioeradication.org/polio-today/polio-now/public-health-emergency-status)





If a type 1 or 3 virus is detected, the situation will be monitored using existing surveillance to exclude ongoing excretion by someone who is immunosuppressed (iVDPV).

If there are ongoing detections, potential actions would be to identify this person; however, this scenario is deemed unlikely.

### 3.2.2 Sabin/Sabin-like viruses (type 2)

As novel oral polio vaccine type 2 (nOPV2) is not used in Aotearoa, any detection of Sabin-like type 2 poliovirus in Aotearoa must be reported to the WHO under the IHR. International guidance states that investigation of Sabin-like type 2 poliovirus detection should be initiated within 48 hours, particularly for sources of tOPV.<sup>21</sup>

### 3.2.3 Non-Sabin viruses WPV or VDPV (type 1, 2 or 3)

The response may vary slightly depending on virological and epidemiological features (including if there were any genetically linked isolates found in human samples).

If a VDPV is detected, the sequencing lab will review the result and compare it with existing strains and determine whether it is a known cVDPV (genetic link to one or more known current or historical cVDPVs), a new cVDPV (genetic link to a previously detected aVDPV), or new VDPV (newly detected VDPV, without known genetically linked previous VDPV).

Detection of a new or known cVDPV would trigger an immediate response.

Detection of a new VDPV would require a detailed field investigation, including:

- active case finding
- enhanced acute flaccid paralysis (AFP) surveillance
- an immunisation coverage survey<sup>22</sup> to determine whether the detection was likely to signify community transmission or shedding from a person with primary immunodeficiency diseases (iVDVP) or an importation event (without detection of community transmission).

As per section 2.3, the WHO classifies an outbreak as two separate detections from the environment, where separate means the samples were collected from *two different sites*

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<sup>21</sup> For full guidance, please see the WHO's *A Guide for Investigation of Sabin Like 2 (SL2) Poliovirus in a Human or in the Environment* ([polioeradication.org/wp-content/uploads/2017/03/SL2-investigation-guide\\_WHO-HQ09032017.pdf](https://polioeradication.org/wp-content/uploads/2017/03/SL2-investigation-guide_WHO-HQ09032017.pdf)).

<sup>22</sup> An immunisation coverage survey looks at the proportion of the target population vaccinated with a given vaccine-dose of the third dose of pentavalent vaccine (containing diphtheria-tetanus-pertussis (DTP), *H. influenzae* type b and hepatitis B vaccines), which is used as a proxy indicator to obtain more accurate information on vaccination performance than that derived from routine administrative reports, or to complement them.

*with no overlapping catchment areas or from the same site but at least two months apart, or newly detected cVDPV, whether in a human or environmental sample.*

Although the WHO states that an outbreak is two separate detections, considering the delays in identifying the VDPV sequence (eg, iVDPV) alongside our low immunisation rates, we would consider any detection of poliovirus in wastewater (excluding detection of Sabin-like viruses) as a potential threat and would take a precautionary approach that can be scaled back if appropriate. This precautionary approach is also warranted as, although it is theoretically possible that poliovirus detected through environmental surveillance could come from one individual, this is unlikely.<sup>23</sup> Our approach to this situation would involve urgent assembling of a response team, public health investigation and risk assessment. This may also include enhanced surveillance mechanisms and/or active case finding to look for evidence of local circulation, and prompt scaling up of vaccination efforts.

### 3.2.3.1 Intermittent/once-off detection vs sustained detection

If there was detection of WPV or VDPV from an environmental sample, it is important to try and determine whether this represents recent importation of the virus or poliovirus circulation in the community.

**Sustained detection of vaccine-derived strain** is more likely to suggest poliovirus circulation in the community. According to WHO estimates, the maximum sample sensitivity of environmental surveillance is detection of one individual infection with poliovirus among 10,000 uninfected individuals, suggesting that repeated detections in the same site are likely to indicate that there is virus circulating in the community. However, this should be evaluated based on timing and location of detection (with WHO outbreak criteria specifying detection of WPV or cVDPV in a time period *>2 months in the same location or in two separate locations*) as well as associated **virological** and **epidemiological** information. Figure 2 shows steps in assessing risk in the case of detection in wastewater.

### 3.2.3.2 Determination of community spread

To determine whether there is community spread of polio versus evidence of an imported case or shedding following OPV vaccination in an immunocompromised person, in addition to the virological testing and sequencing described above, further epidemiological investigation is required, including active case finding and enhanced surveillance for AFP cases in the area and collection of stool specimens from healthy persons in the community. Efforts to rule out local circulation should be particularly intense if sequencing of the index VDPV isolate is consistent with prolonged independent replication.

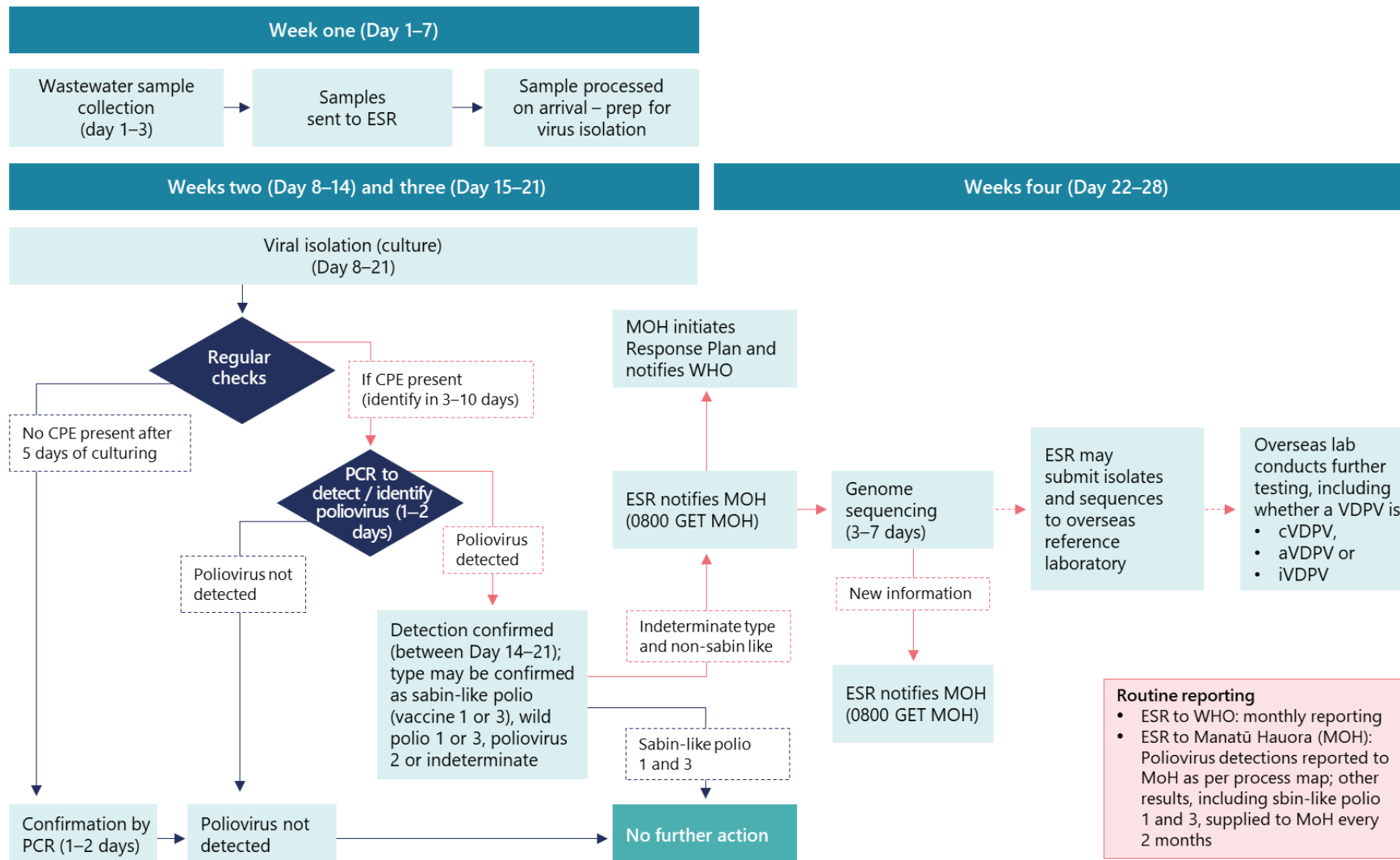
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<sup>23</sup> Public Health England. 2019. *PHE National Polio Guidelines: Local and Regional Services*. URL: [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/833211/National\\_polio\\_guidelines\\_2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/833211/National_polio_guidelines_2019.pdf) (accessed 26 September 2023).



**Figure 2: Poliovirus characterisation and risk guidance**

**Poliovirus wastewater surveillance – process and approximate timeframes**



**Abbreviations:**

CPE = cytopathic effect  
aVDPV = ambiguous VDPV

MOH = Manatū Hauora  
cVDPV = circulating VDPV

PCR = polymerase chain reaction  
iVDPV = immune-deficiency associated VDPV

VDPV = vaccine-derived poliovirus



## 3.2.4 Community context

The context of the community where poliovirus is detected in wastewater is critical for informing our response. Key information that may help guide our response will include:

- the sociodemographic and epidemiological profile, including ethnicity, socio-economic status and prevalence of disability and diseases such as diabetes
- iwi and hapū associated with the community, including relevant Iwi Māori Partnership Boards (IMPBs)
- health services, and community access to these
- vaccination profile
- high-risk settings (eg, prisons, aged residential care etc)
- recent environmental events
- migration patterns of community.

There should also be community social mapping, including health behaviours, immunisation practice and barriers, and identification of key stakeholders (including Māori, iwi and hapū as above).

## 3.2.5 Enhanced microbiological surveillance

In the case of all detections we will consider:

- **enhancing wastewater surveillance** to increase sensitivity and specificity of detection of community transmission. Sample sites and frequency of testing (along with processing) will be reviewed and adjusted as required to evaluate presence in time and area (to be further defined). Retrospective testing by at least direct PCR may be performed
- **enhancing enterovirus/microbiological surveillance**, including:
  - adding poliovirus testing to microbiological testing of stool specimens sent to laboratory for testing in the community of detection to look for community transmission
  - enhancing surveillance of aseptic meningitis and other clinical syndromes (when other causes are excluded) — for example, testing of cerebrospinal fluid (CSF) for poliovirus and/or systematic stool sampling of all acute neurological illnesses (potential poliovirus-related presentations) to look for cases (noting that poliovirus detection in CSF is poor, and therefore focusing on stool testing may be preferable — see also section 1.5.1 for further details).
- **targeted healthy children stool sampling** if there is an isolated detection of WPV or VDPV in environmental testing and uncertainty around community transmission (see section 1.5.1, noting that this community should be well defined. This should only be conducted after confirmation that a VDPV is not genetically linked to another VDPV.



## 3.2.6 Enhanced AFP surveillance

In the case of all environmental detections we will consider enhanced clinical surveillance/active case finding to increase the proportion of cases reported and timeliness of reporting through:

- communications to clinicians
- hospital admission surveillance (retrospective case searches/6-month record reviews for undetected/unreported AFP cases, and investigating unreported AFP cases)
- community outreach and sensitisation
- expanding AFP surveillance to include adults
- legal instruments to improve surveillance (ie, making AFP notifiable).

See section 1.5.2 for further details.

## 3.2.7 Communications

General principles:

- Communications strategies will be developed and implemented through collaboration with key partners, including Te Whatu Ora Pacific health and equity teams, Te Aka Whai Ora, Whaikaha, and Manatū Hauora.
- Immunisation promotion is ongoing (see [immunise.health.nz](https://immunise.health.nz)).
- Targeted communications will be informed by our Te Tiriti obligations, location of detection and corresponding demographic and immunisation profile, and informed by a pro-equity approach for those at higher risk of exposure, acquisition and/or poor outcomes of poliovirus.
- As per our Te Tiriti obligations and Pae Ora legislation principles, communications strategies must be developed, implemented and monitored in partnership with Māori. This may be supported through partnering with IMPBs and Te Aka Whai Ora.
  - This approach will be designed in collaboration with communities to ensure that messaging is effective and appropriate.
  - For Māori whānau, hapū and iwi, this may be supported through partnering with IMPBs and Te Aka Whai Ora.
  - For Pacific peoples, this may be supported through working with the Ministry for Pacific Peoples and relevant faith-based and community groups.
  - For some ethnic and refugee populations, there may also be collaboration with relevant agencies such as the Ministry for Ethnic Communities.
  - For disabled populations, there may be consultation and collaboration with disabled people, the disability community and the wider disability sector (organisations and people who work to support disabled people). This may be supported by Whaikaha.
  - Communication approaches and materials will consider needs of diversity of audience and corresponding format requirements (eg, channel, translations, and in standard accessible formats).
  - Caution is needed when targeting specific populations to avoid stigmatising these groups, and their privacy must be maintained.



- There is a need to ensure clear communications with neighbouring countries, including Australia and Pacific Island nations.

### 3.2.8 Case and contact management

Information on case identification (including case classifications), case response, laboratory testing, and case and contact management can be found in the *Communicable Disease Control Manual*.<sup>24</sup> Case and contact management will only be required if any of the enhanced surveillance actions identify any cases. Note that if any cases are identified these will be investigated, including history of overseas travel. If the case has no risk factors for polio such as overseas travel, this indicates community transmission, and as this is higher risk a corresponding escalation of response needs to be taken.

### 3.2.9 Immunisation

Given our current immunisation rates and particularly inequities seen within these both geographically and for Māori tamariki, any detection in wastewater would be perceived as a risk and therefore would require an urgent response, which may be required prior to further epidemiological and virological evidence of community transmission becoming available. Genetic sequencing may take 2–3 days, or potentially longer depending on testing and confirmation from overseas reference laboratories, and therefore a precautionary approach regarding scaling up a vaccination response should be taken while awaiting further results.

Approaches to immunisation would be based on poliovirus category and sequencing as well a single or sustained detection and/or evidence of community transmission.

As per WHO guidance, a vaccination response is warranted in all outbreaks (see section 2.3 for definitions) of any type (ie, WPV or VDPV, all types) and high-risk type 2 events as follows:

- importation event involving cVDPV2 unless travel associated
- new emergence event involving VDPV2 in a human
- new emergence event involving VDPV2 in the environment plus additional risk factors, including:
  - virus is highly divergent (>12 nt) or in areas that implemented OPV2 supplementary immunisation activities more than six months ago
  - poor quality polio surveillance
  - presence of inaccessible or hard to reach populations and/or presence of displaced or highly mobile populations.

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<sup>24</sup> Te Whatu Ora. 2023. *Communicable Disease Control Manual*. URL: [tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual](https://www.tewhatauora.govt.nz/for-the-health-sector/health-sector-guidance/communicable-disease-control-manual) (accessed 26 September 2023).



### 3.2.9.1 Single detection of poliovirus in wastewater, no evidence of community transmission

If there was a single detection of poliovirus in wastewater, and no evidence of community transmission (eg, virological or epidemiological), this could be leveraged to promote routine childhood vaccination activities that include targeted approaches for specific populations (eg, immunisation delivery through kaupapa Māori providers) so that there was an increased national campaign plus locally targeted campaigns.

### 3.2.9.2 Sustained detection and/or evidence of community transmission

If there was sustained detection meeting WHO outbreak criteria, or other evidence of community transmission (eg, detection of genetically similar poliovirus in human, cVDPV) this would require supplementary immunisation activities to improve polio vaccine coverage, noting that IPV is delivered in a combination vaccine and so this would also provide protection for other vaccine-preventable illnesses. This would be through an increased national campaign plus locally targeted campaign(s). There may be consideration of use of OPV in the future, but this is unlikely at the current time.

## 3.3 Detection in a person with AFP

A detection of poliovirus in a person with AFP would be considered an outbreak. It is important to ascertain whether this person had risk factors for disease — for example, travel to polio-endemic regions or to regions where there are known outbreaks of VDPV. If so, this may represent an isolated importation of the virus, whereas if they do not have risk factors this is likely to indicate that there has been asymptomatic community transmission.

**Any** detection in a person with AFP would require:

- a nationally coordinated emergency response
- public health investigation — including source investigation/case and contact tracing and management (described in the *Communicable Disease Control Manual*)
- risk assessment.

Based on findings from the public health investigation and risk assessment, this would result in the following actions:

- enhanced surveillance
- national and targeted communications
- vaccination response.

Further microbiological analysis would support this response, but it is most likely that this case would be of vaccine-derived polio (VDPV2) as has been seen in other cases in non-endemic countries. This is related to the use of OPV2 vaccines to respond to cVDPV2 outbreaks. When Manatū Hauora is notified, the type of poliovirus will be known; however, genomic sequencing and further genetic characterisation (eg, comparing to known viruses) will take longer, at least 2–3



days, and potentially longer if testing and confirmation from overseas reference laboratories is also required.

If a case of poliovirus is detected in an asymptomatic person (eg, from stool sampling) this should be treated in the same way as in a confirmed case of polio in a person with AFP.

### 3.3.1 Community context

As for detection in environment (section 3.2) it is critical to understand the community context that the positive case came from. Critical features are described in section 3.2.4.

### 3.3.2 Immunisation

#### 3.3.2.1 Imported case

If a case had risk factors such as a history of travel to polio-endemic countries or where there are known outbreaks of VDPV, and therefore was thought to most likely be an imported case of polio (or closely related to an imported case), there would need to be case and contact tracing and management, including appropriate vaccination of contacts. Routine childhood vaccination activities will also continue, including targeted approaches for specific populations (eg, immunisation delivery through kaupapa Māori providers). There should also be enhanced surveillance put in place to exclude further transmission. There may be both national and local level supplementary immunisation activities depending on risk assessment.

#### 3.3.2.2 Community transmission

If this case suggested community transmission (eg, had no risk factors such as travel history to outbreak countries), this would require supplementary immunisation activities to improve polio vaccine coverage, noting that IPV is delivered in a combination vaccine, so this would also provide protection for other vaccine-preventable illnesses.

Either of these scenarios would constitute risk for Aotearoa; however, an imported case may signify lower risk compared to a scenario where the case had no known risk factors, suggesting community transmission, which may require a higher level of response. See also the summary table in section 3.6 below.

### 3.3.3 Enhanced microbiological surveillance

In the case of detection in one person with AFP we would take the following actions:

- **Enhance wastewater surveillance** to increase sensitivity and specificity of detection of potential community transmission. Sample sites and frequency of testing (along with processing) will be reviewed and adjusted as required to evaluate presence in time and area (to be further defined). Retrospective testing by at least direct PCR may be performed.
- **Enhance enterovirus/microbiological surveillance**, including:





- adding poliovirus testing to all stool specimens sent to laboratory for testing in location(s) associated with case
- enhancing surveillance of aseptic meningitis and other clinical syndromes (when other causes are excluded) — for example, testing of CSF for poliovirus and/or systematic stool sampling of all acute neurological illnesses (potential poliovirus-related presentations) — noting that poliovirus detection in CSF is poor, and therefore focusing on stool testing may be preferable (see also section 1.5.1 for further details).

### 3.3.4 Enhanced AFP surveillance

If poliovirus was confirmed in an AFP case we would **enhance clinical surveillance/active case finding** to increase the proportion of cases reported and timeliness of reporting — for example, through increasing communications to clinicians, and AFP surveillance expansion to adults (see section 1.5.2 for further details).

### 3.3.5 Communications

If there was detection of poliovirus in an AFP case we will refer to key messaging and responses within a detailed communications plan. However the general principles are the same as for detection in wastewater testing (section 3.2). Any communications around a confirmed case of poliovirus in an AFP case would need to be done with consideration of anxiety that may emerge because of the historical memory and lived experience for some communities, whānau and individuals.

## 3.4 Facility-related exposure to live polioviruses

If there was a known facility-related exposure to a live poliovirus, the WHO has detailed guidance for the public health response.<sup>25</sup> The main components or strategies used to respond to a breach of containment and prevent the potential establishment of further transmission include:

- risk assessment
- isolation of exposed persons and quarantine of their contacts, and stool and throat sample analyses to assess poliovirus shedding
- infection control and disinfection
- education of health care workers and cleaning staff.
- targeted vaccination.

<sup>25</sup> See the WHO's *Public health management of facility-related exposure to live polioviruses* ([polioeradication.org/wp-content/uploads/2021/05/Public-Health-Management-of-Facility-related-Exposure-to-Live-Polioviruses-EN-20210520.pdf](https://polioeradication.org/wp-content/uploads/2021/05/Public-Health-Management-of-Facility-related-Exposure-to-Live-Polioviruses-EN-20210520.pdf)).

- communications (noting that the identity of concerned individuals should only be shared on a need-to-know basis (eg, not released to the public) as it may expose them to stigma and discrimination)

Critical factors for success of this response include timeliness of:

- recognition and reporting of the incident
- thorough and prompt risk assessment of contaminant breach (preferably within 48 hours of a breach)
- identification of source
- root cause analysis of the breach and its rectification, including prevention of recurrence
- identification of all polio exposed or infected persons — case and contact management including actions such as:
  - isolation or quarantine where indicated
  - testing
  - vaccination of exposed persons and contacts where appropriate.

Risk assessment of the poliovirus exposure may include:

- characteristics of the breach, including type of poliovirus with a contaminant breach or exposure anywhere involving WPV2 or VDPV2 being assessed as very high risk — other high risk exposures include any exposure involving:
  - WPV1/VDPV1 or WPV3/VDPV3
  - Sabin-like 2, in a country with inadequate type 2 immunity (less than 90% IPV coverage)
- pathway of exposure
- use of adequate personal protective equipment
- time elapsed since the breach
- community context (eg, subpopulations at high risks)
- other factors that are part of case and contact management (eg, immunisation history, travel history)
- contact tracing to limit potential spread of poliovirus (please see *Communicable Disease Control Manual* for further details).

### 3.4.1 Enhanced microbiological surveillance

If there was a facility-related exposure to a live poliovirus we would:

- **alert diagnostic laboratories in the area to the possibility of poliovirus being detected,** and plan for referral of specimens to facilities with appropriate contaminant capabilities
- **consider enhanced wastewater testing** around facility or community of exposed persons for a limited duration, which may be in consultation with the WHO regional office.

All actions would need to be discussed with ESR, relevant laboratories and associated stakeholders, and may require activation of a laboratory surge plan.



## 3.4.2 Enhanced AFP surveillance

Following a facility-related exposure to a live poliovirus we may **consider** enhanced clinical surveillance/active case finding (see section 1.5.2 for further details).

## 3.4.3 Communications

A breach in containment may elicit media interest that needs to be addressed, but it is important to keep the identities of involved persons confidential as far as possible.

## 3.4.4 Education of health care workers including cleaning staff

In the event of a facility-related exposure to a live poliovirus there will need to be education provided to health care workers including cleaning staff, and other staff in the facility. Staff should be reminded of appropriate contact precautions, testing and immunisation, and referred to infection prevention and control (IPC) guidance (see *Communicable Disease Control Manual*).

## 3.4.5 Immunisation

If there was a facility-related exposure to a live poliovirus we would ensure appropriate vaccination of exposed persons (as per *Communicable Disease Control Manual*).

Depending on the risk assessment there would also be consideration of an increased national campaign plus locally targeted campaigns if there was evidence of community transmission.

# 3.5 Known contact of a case overseas

If there was a known contact in Aotearoa of a case identified overseas, the local public health service will lead the investigation, testing and management of the contact (as per the 'Poliomyelitis' chapter of the *Communicable Disease Control Manual*)

National support and coordination will be provided as required and *may* include an Initial Assessment Team (IAT) meeting to determine:

- the community context
- potential for unidentified contacts
- communication requirements
- additional response activities.

As a result of the IAT meeting, there may be a determination to implement an Incident Management Team (IMT) response to manage various response activities.



There may be consideration of enhanced surveillance depending on the public health investigation and risk assessment. This could include actions such as:

- increasing sample sites and frequency of wastewater testing to evaluate presence in time and area
- enhanced enterovirus/microbiological surveillance based on IAT meeting and assessment of likelihood of unidentified contacts/cases in a community
- enhanced clinical surveillance/active case finding.



## 3.6 Summary table of key scenarios and potential responses

See the *Communicable Disease Control Manual* for details of case and contact management.

Responses will depend on public health risk assessment and associated decision making by key stakeholders.

Given potential delays in genetic sequencing of the virus, based on the precautionary principle, actions to address a higher risk situation should be considered in **any** scenario initially. This can then be reassessed as further genetic and epidemiological characterisation becomes available to inform response.

Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk:	Higher risk:	Higher risk:	Lower risk:	Higher risk:		
	<b>No risk or little risk:</b> Sabin or Sabin-like type 1 or 3 (likely shedding following OPV) <sup>a</sup>	<b>Lower risk:</b> No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	<b>Higher risk:</b> New VDPV, even without evidence of community transmission	<b>Higher risk:</b> Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	<b>Lower risk:</b> Imported case <sup>c</sup>	<b>Higher risk:</b> Community transmission	Risk depends on type of poliovirus detected	<b>Lower risk</b>
<b>Enhanced microbiological surveillance<sup>d</sup></b>								
Common actions	No action required		<ul style="list-style-type: none"> <li>Review and adjust sample sites and frequency of wastewater to evaluate presence in time and area.</li> <li>Consider adding poliovirus to microbiological testing of all stool specimens in community of detection.<sup>e</sup></li> <li>Consider enhanced surveillance of aseptic meningitis and other clinical syndromes.</li> </ul>					



Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk:	Higher risk:	Higher risk:	Lower risk:	Higher risk:	Risk depends on type of poliovirus detected	Lower risk
	<b>No risk or little risk:</b> Sabin or Sabin-like type 1 or 3 (likely shedding following OPV) <sup>a</sup>	No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	<b>Higher risk:</b> New VDPV, even without evidence of community transmission	<b>Higher risk:</b> Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	<b>Lower risk:</b> Imported case <sup>c</sup>	<b>Higher risk:</b> Community transmission	Risk depends on type of poliovirus detected	Lower risk
Key differences		<ul style="list-style-type: none"> <li>Consider targeted healthy children stool sampling</li> </ul>			<ul style="list-style-type: none"> <li>Consider targeted healthy children stool sampling</li> </ul>		<ul style="list-style-type: none"> <li>Consider limited duration environmental surveillance around facility or community of exposed person(s).</li> </ul>	
<b>Enhanced AFP surveillance</b>								
Common actions	No action required		Actions to improve proportion of cases reported, proportion that have stool samples collected for testing, and timeliness of reporting and follow-up. This may include: <ul style="list-style-type: none"> <li>communications to clinicians</li> <li>hospital admission surveillance</li> <li>community outreach and sensitisation</li> <li>expanding AFP surveillance to include adults</li> <li>legal instruments to improve surveillance.</li> </ul>					



Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk: No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	Higher risk: New VDPV, even without evidence of community transmission	Higher risk: Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	Lower risk: Imported case <sup>c</sup>	Higher risk: Community transmission	Risk depends on type of poliovirus detected	Lower risk
<b>Communications (details contained within communications plan)</b>								
Common actions	No action required		<ul style="list-style-type: none"> <li>• Provide key messaging around poliovirus and AFP to public and media.</li> <li>• Promote uptake in vaccinations, with targeted campaigns for communities who may be at greater risk of acquiring poliovirus and/or at greater risk of poorer outcomes.</li> <li>• Provide communications to the health sector, including public health services, clinicians and lab.</li> <li>• Translate all communications into alternative formats and other languages (where possible prepare prior).</li> </ul>				None specifically required	
Key differences			<ul style="list-style-type: none"> <li>• Targeted communications in community associated with detection.</li> </ul>	<ul style="list-style-type: none"> <li>• Targeted communications in community associated with case.</li> </ul>	<ul style="list-style-type: none"> <li>• May need to respond to media attention around this, but important to keep identity of exposed person(s) confidential as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• May require response to media attention (if arises) and/or proactive communications to the health sector if enhancing AFP surveillance.</li> </ul>		



Response component		Detection in wastewater			Detection in a person with AFP		Facility-related exposure to live polioviruses	Known contact of a case overseas
		Lower risk:	Higher risk:	Higher risk:	Lower risk:	Higher risk:		
	<b>No risk or little risk:</b> Sabin or Sabin-like type 1 or 3 (likely shedding following OPV) <sup>a</sup>	<b>Lower risk:</b> No evidence of community transmission or no confirmation of this (WPV, aVDPV, iVDPV)	<b>Higher risk:</b> New VDPV, even without evidence of community transmission	<b>Higher risk:</b> Evidence of community transmission (two or more detections of WPV or VDPV, <sup>b</sup> cVDPV)	<b>Lower risk:</b> Imported case <sup>c</sup>	<b>Higher risk:</b> Community transmission	Risk depends on type of poliovirus detected	<b>Lower risk</b>
<b>Immunisation</b>								
Common actions	No action required		<ul style="list-style-type: none"> <li>Increased national campaign plus locally targeted campaigns</li> </ul>					
Key differences				<ul style="list-style-type: none"> <li>Supplementary immunisation activities</li> </ul>		<ul style="list-style-type: none"> <li>Supplementary immunisation activities</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate vaccination of contacts<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>Appropriate vaccination of exposed person with or without vaccination of contacts<sup>e</sup></li> </ul>

**Key:** AFP = acute flaccid paralysis; aVDPV = ambiguous vaccine-derived poliovirus; cVDPV = circulating vaccine-derived poliovirus; iVDPV = immune-deficiency associated vaccine-derived poliovirus; OPV = oral poliovirus vaccine; WPV = wild poliovirus.

**Notes:**

- The International Health Regulations (IHR) require countries to notify the WHO of all vaccine type 2 viruses (Sabin or Sabin-like).
- In strains resembling iVDPV, repeated isolation of the same or a genetically distinct but related virus from the same site does not necessarily indicate an emerging outbreak.
- Risk factors for disease include travel to polio-endemic regions or to regions where there are known outbreaks of VDPV.
- Enhanced surveillance to be considered in the context of laboratory capacity and capability to ensure feasibility, as well as prioritisation in terms of response.
- This should include defining population for testing, with consideration of lab capacity.
- Part of case and contact management (see *Communicable Disease Control Manual* for further details).





## 3.7 End of outbreak and monitoring and evaluation

### 3.7.1 End of outbreak

A polio outbreak can be declared over once no poliovirus has been detected from any source for at least 6 months, alongside good evidence of high-quality effective immunisation response and **sensitive surveillance**.

#### 3.7.1.1 Sensitive surveillance

Following any outbreak, AFP surveillance would need to be monitored to ensure that it reaches WHO requirements of the increase of the annualised target for the non-polio AFP rate to >3 per 100,000 children <15 years old per year for ≥12 months after the last case or isolate in outbreak-affected and polio high-risk areas. This would need to occur if there was sustained detection of poliovirus in wastewater or a case of poliovirus detected.

If wastewater testing is enhanced following an outbreak, this should not compromise AFP surveillance as the gold standard surveillance tool as per WHO guidance.

### 3.7.2 Monitoring and evaluation

There is a need for ongoing quality assurance for outbreak response that may include quantitative and qualitative methods for core components of response before, during and after implementation. There should also be partnership with Māori, including through Te Aka Whai Ora and IMPBs, to ensure that Māori voice is reflected in monitoring and evaluation for a polio response, including a te ao Māori perspective on outcomes. All monitoring and evaluation should be designed to ensure outcomes for different priority groups are captured, enabling an equity analysis that should include disaggregation of quantitative data by characteristics such as gender, ethnicity and disability status. This is particularly important to ensure we are meeting our Te Tiriti obligations of protection and equity of health outcomes. Examples of key components for monitoring and evaluation and/or associated indicators at each stage of response are listed below.

#### **Planning and preparation:**

- Ongoing review of AFP surveillance
- Evidence of training for all relevant personnel
- Preparation of relevant plans, including vaccination and communications planning
- Early engagement with targeted groups as required

**Implementation:**

- **Surveillance** — monitoring AFP surveillance in affected area and monitoring enhanced surveillance (eg, increased yield cases)
- **Vaccination** — intra-campaign monitoring, spot checks (by monitors, supervisors and independent campaign observers) and surveys for coverage
- **Communication and social mobilisation/engagement** — evidence of increased sensitisation following targeted communications, active community support for outbreak response, and vaccine hesitancy/refusal.

**Post-outbreak follow-up:**

- **Surveillance** — AFP surveillance post-outbreak
- **Vaccination** — post-outbreak/supplementary immunisation activities campaign coverage, no evidence of persistently missed children or missed geographic areas, including disaggregated data for high-risk populations
- **Communication and social mobilisation/engagement** — evidence that campaign awareness was high, and that there was high awareness in priority populations.

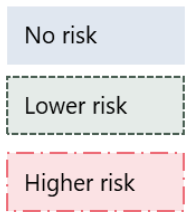
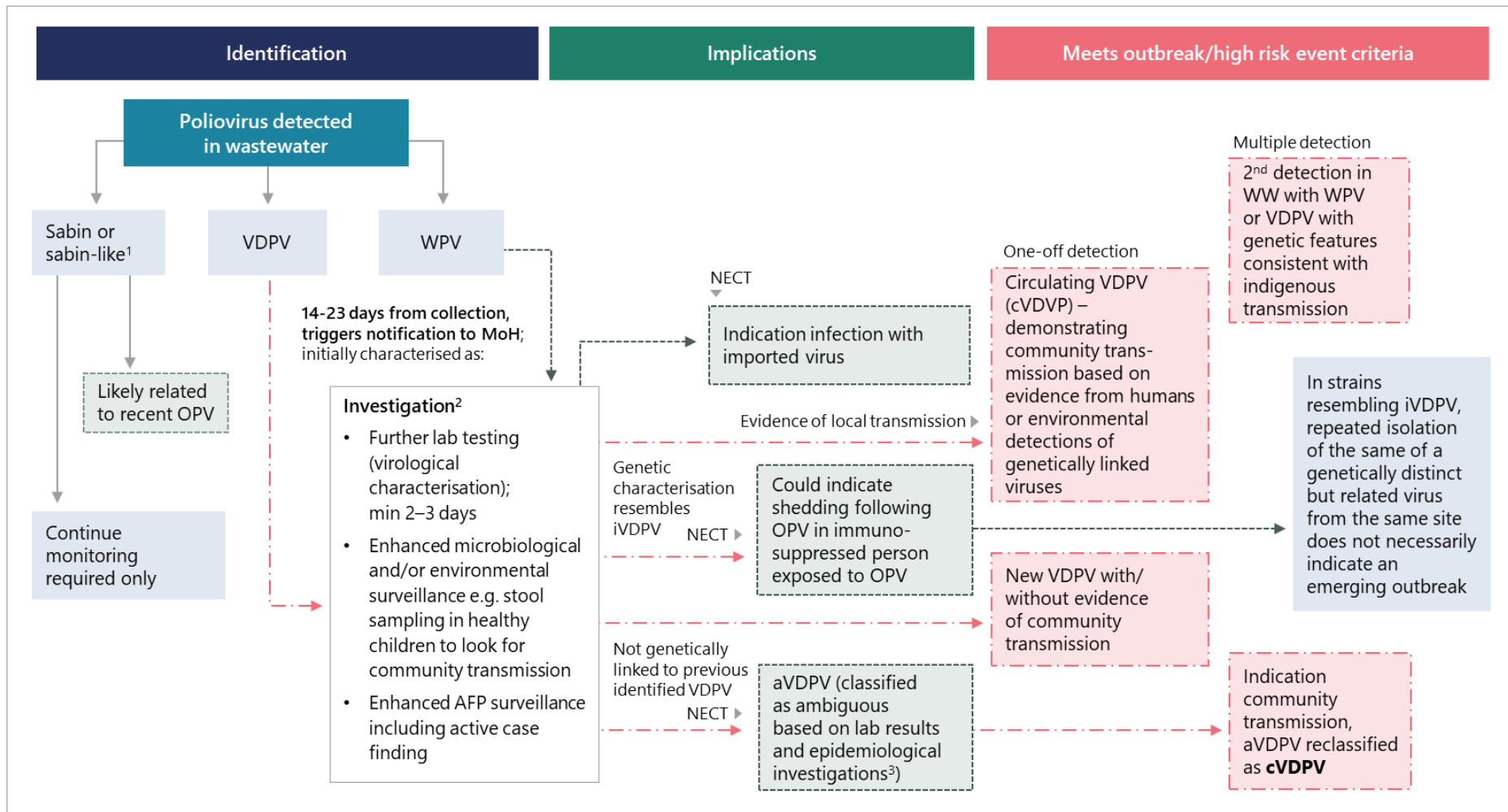


# Appendix 1: Timelines for wastewater laboratory testing<sup>26</sup>

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<sup>26</sup> As at time of publication.





Abbreviations  
 aVDPV = ambiguous VDVP  
 cVDVP = circulating VDVP  
 MOH = Manatū Hauora  
 NECT = no evidence of community transmission  
 iVDPV = immune-deficiency associated VDPV  
 VDPV = vaccine-derived poliovirus  
 WW = wastewater

Notes  
 1 = Note that Sabin/Sabin-like type 2 viruses are notifiable  
 2 = This is not an exhaustive list of actions  
 3 = VP1 sequence not genetically linked to other previously identified VDPV sequences and isolates may be from persons with no known immune deficiency or from an environmental sample, without evidence of circulation

