NIPH
Norwegian Institute of Public Health

REPORT

2018

National Plan of Action to Sustain a Poliomyelitis-Free Status

National Polio Outbreak Preparedness and Response Plan

Norway

Updated on 19. September 2018

National Plan of Action to Sustain a Poliomyelitis-Free Status

National Polio Outbreak Preparedness and Response Plan

Norway

Updated on 19. September 2018

NIPH
Norwegian Institute of Public Health

Published by the Norwegian Institute of Public Health
Division of Infection Control and Environmental Health
Department of Vaccine Preventable Diseases
December 2018

Title:
National Plan of Action to Sustain a Poliomyelitis-Free Status
National Polio Outbreak Preparedness and Response Plan
Norway
Updated on 19. September 2018

Publication type:
Report

Endorsed by:
Name: Karl Olav Watne
Designation: Norwegian Ministry of Health
Date: 24.10.2018

Distributed to:
Norwegian Ministry of Health
Norwegian Directorate of Health
Norwegian Institute of Public Health (IHR Focal point)
WHO

Order:
The report can be downloaded as pdf at http://www.fhi.no/en/publ/

Graphic design template:
Per Kristian Svendsen

Graphic design cover:
Fete Typer

ISBN digital 978-82-8082-985-6

Emneord (MeSH):

Citation: National Plan of Action to Sustain a Poliomyelitis-Free Status. National Polio Outbreak Preparedness and Response Plan. Norway. Updated on 19. September 2018. Report 2018. Oslo: Norwegian Institute of Public Health, 2018.

Innhold

Introduction

Norway has been declared polio-free since 2002. *The National Polio Outbreak Preparedness and Response Plan* has been developed so the country is prepared for a possible renewed outbreak of wild poliovirus (WPV) or vaccine derived polio virus (VDPV), following WPV importation or emergence of circulating VDPV (cVDPV). In a previously polio-free country like Norway, the occurrence of a polio case due to WPV or cVDPV must be considered as a national public health emergency, urgently requiring a rapid response. This document is developed in line with recently published Standard Operating Procedures for poliovirus outbreak response and operational guidelines on polio outbreak response[1].

Since Norway is situated far from the few remaining endemic areas of the world and oral polio vaccines (OPV) is no longer available, a possible renewed outbreak of wild WPV or VDPV is unlikely. Never the less, the migration and travel patterns in the world today put also Norway at risk for a renewed polio outbreak. One of the large groups of refugees arriving in Norway are from Afghanistan, and we have a large Pakistani community. One of the very few remaining endemic areas are the border between Afghanistan and Pakistan, hence importation from travelers from these areas constitutes a potential risk also in Norway. The outbreak of cVDPV virus in Syria, and the large number of Syrian refugees to Europe also constitute a potential risk. Hence, an updated and clear plan to both maintain Norway polio-free and a plan to stop a polio outbreak is mandatory also for Norway.

As *The National Polio Outbreak Preparedness and Response Plan* is closely linked to and partly rests on the measures taken to sustain a polio-free status in Norway*, The National Plan of Action to Sustain a Polio-free status* is presented in the same document. *The National Plan of Action to Sustain a Polio-free status* was written and sent from the Ministry of Health to WHO 23. May 2002, and is now presented in an updated version in this joint document.

This document comprising both plans is reviewed by the National Certification Committee (NCC) and will be submitted to the Regional Certification Commission (RCC).

[1] Please see the GPEI's technical guidance for outbreak response, including the Standard Operating Procedures (SOPs), at http://www.polioeradication.org/Resourcelibrary/Resourcesforpolioeradicators/Technicalguidelines.aspx

Country background

Norway has a total population of 5 258 317, with 59 355 children below 1, 366 722 children below 5 and 1 000 025 children below 15 years of age (1.January 2017). Norway is divided into 18 counties, and further in 426 municipalities. The highest population density is in and around Oslo.

The childhood immunization program is free of charge. Vaccines are purchased by Norwegian Institute of Public Health (NIPH) following public tenders. The municipality health service is responsible for providing immunisations. Immunisations are mainly administered through public child health care centres and the school health service organized within the municipalities. All vaccine doses administered are mandatorily notified to the Norwegian immunization registry (SYSVAK). The general uptake for all childhood immunization program vaccines is high, between 92-95%. (Trogstad, Ung et al. 2012).

Inactivated polio vaccine (IPV) was introduced in the national immunization program in 1956, but as this did not lead to full control with the disease IPV was replaced by oral polio vaccine (OPV) in 1965. In the years following introduction of OPV poliomyelitis due to WPV was eliminated in Norway, but poliomyelitis due to vaccine derived virus was an infrequent but existing concern following the use of OPV. From 1970, poliomyelitis due to WPW was not found in Norway, hence the occurrence of vaccine-derived polio-cases was no longer acceptable and IPV was reintroduced in 1979. OPV has not been available in Norway since the year 2000. When polio-vaccination was introduced in 1956, a catch-up programme was offered to all citizens under the age of 40 years. Together with the current policy of offering polio-vaccination to new-arrivals in Norway all persons living in Norway born after 1915 will at one time have been offered vaccination against polio.

All polio vaccines are provided from the NIPH. The distribution chain to municipalities is well-run, and NIPH ensures stable polio vaccine availability by regular tender processes and stockpiling of vaccine. In the current childhood immunization schedule IPV is given as a combination vaccine at ages 3, 5 and 12 months with booster doses at 7 and 15 years of age. The coverage of 3 doses of IPV during infancy has been stable at around 95 %, while the coverage of the booster dose at early school age and later school age are 93 and 92 %, respectively, on average the last 6 years.

The last known case due to indigenous poliovirus was in 1969, and the last imported case was in 1992. This did not lead to an outbreak. Norway together with the European region was declared free of polio in 2002.

The economic and political situation for Norway is stable, with a high standard of living, a solid health infrastructure and a good security situation. The main potential risk groups regarding poliovirus outbreak are newly arrived refugees with insufficient polio vaccination status.

According to the Norwegian Health Emergency Preparedness Act of 2001 (*Lov om helsemessig og sosial beredskap,* 1. July 2001) the overall responsibility for preparedness in all health-related emergencies rests with the Ministry of Health, and on delegation the Norwegian Directorate of Health is responsible for the coordination of all health resources in the case of an emergency: the municipalities and their Municipality Medical Officers, the counties with their County Medical Officers, the regional health trusts which organizes all hospitals, and national institutions like the NIPH. NIPH is the national expert body

regarding all matters related to public health. According to the Norwegian Infectious Disease Control Act (*Lov om vern mot smittsomme sykdommer*, 1. January 1995) the Norwegian Institute of Public Health is responsible for monitoring infectious diseases in Norway and contributing to international surveillance. NIPH is the national focal-point for International Health Regulations (IHR) and European Commission´s Early Warning and Response System (EWRS). NIPH is directly organized under the Ministry of Health.

According to the Health Emergency Preparedness Act, and the National Health Preparedness Plan (*Helseberedskapsplanen,* published by the Ministry of Health, latest update 01.01.2018) the responsibility for planning and managing a health emergency rests with the bodies that are responsible for the daily delivery of health services. Furthermore crisis management is to be performed on the lowest possible level of care, as close to the situation as possible and organized as similarly as possible to the daily health service delivery. In this context each municipalities Medical Officer, which is responsible for infection control within the given municipality on a daily basis, also is the mainstay in health related crisis management. In both the normal situation and in a crisis, the NIPH is the national expert body for consultation and guidance on all aspects of communicable diseases control and management both for the municipality medical officers and all other levels of the health care system.

Approximately 60 infectious diseases are notifiable to the Norwegian Surveillance System for Communicable Diseases (MSIS), including poliomyelitis. Notification to MSIS is mandatory for clinicians and medical microbiological laboratories. Notification is either electronic or paper based.

PLAN OF ACTION TO SUSTAIN A POLIOMYELITIS-FREE STATUS

1 Actions to sustain high levels of polio immunization coverage

1.1 General measures

NIPH will continue to provide polio vaccines to persons living in Norway and maintain a stable and predictable vaccine delivery system. The coverage of three doses of IPV in the childhood immunization program (IPV3) coverage will be aimed to maintain at >90% on a national level but also all sub-national levels (counties and municipalities). Vaccine uptake will be monitored by the on-going mandatory registration of immunizations in SYSVAK.

In addition to the publically funded childhood immunization program that covers all children 0-16 years of age, all citizens are advised to receive a booster dose of polio vaccine every ten years.

Prompt corrective actions will be undertaken to provide vaccinations with IPV to under / unvaccinated children, including training, social mobilization, advocacy, and provision of supplementary immunization either on a sub-national or national level as appropriate.

Sero-prevalence surveys are to be considered in the case of reduced IPV3 uptake in the population, and with special attention towards high-risk population groups (see below).

1.2 Specific measures for high-risk population groups

In Norway the high-risk population groups regarding polio vaccination uptake and hence with risk of spread of polio, are newly arrived refugees and migrants and some minority groups (e.g. Roma).

All newly arrived refugees to Norway are to be assessed for appropriate vaccination status:

- Newly arrived children < 16 years of age are offered vaccinations according to the Norwegian national immunization program, and are offered an additional dose of IPV in the case of sole previous OPV immunization. Catch-up vaccination for all newly arrived children are recommended to start as soon as possible and latest within 3 months of arrival, and upon arrival for children < 2 years of age.
- All newly arrived adults without a certain history of receiving IPV are offered IPV, preferably within 3 months of arrival and latest within one year after arrival. This has been free of charge since 2013.

1.3 Vaccination of travelers

All travelers from Norway to countries with endemic WPV, cVDPV or to countries deemed by WHO as vulnerable to polio importation, are informed about updated vaccine requirements. The general public and all travel vaccine facilities are informed through the NIPH website *fhi.no*.

2 Actions to maintain high quality surveillance

2.1 Surveillance of acute flaccid paralysis (AFP)

AFP surveillance aims to guarantee the polio-free status of Norway by documenting the absence of poliovirus circulation. This is performed through monitoring all AFP cases in children under fifteen years of age in order to detect potential polio virus importation into the country and, should that be the case, to act immediately according to a defined set of measures described in the *Outbreak Preparedness and Response Plan* described below.

According to WHO recommendations, a quality AFP surveillance system should follow the standards described in Table 1. The Norwegian AFP surveillance system is based on the collaboration between NIPH, and a network of clinicians (AFP contacts) at pediatric wards in Norwegian hospitals, acting as local notifying units. Notification is mandatory. If no cases are detected, this is also notified to the NIPH and subsequently to WHO as 'zero case reporting'. The AFP contacts report to the NIPH monthly. The long-lasting AFP surveillance in Norway was recently systematically evaluated through an ECDC/EUPHEM project which looked at the different attributes of the system. Some recommendations to increase the rate and timeliness of reporting have been implemented.

Table 1. AFP surveillance standards according to the WHO

AFP Surveillance Indicators	Targets
Non-polio AFP reporting	≥1 AFP case per 100,000 population <15 years of age ≥80% of AFP cases investigated within 48 hours of reporting ≥80% of AFP cases classified within 90 days of onset
Sub-national AFP reporting	AFP distribution parallels <15 year old population
Timely stool collection	≥80% of AFP cases have 1 specimen (preferably 2 specimens collected at least one day apart) collected within 14 days of symptom onset
Timely stool shipment	≥80% of AFP cases have specimens received at NIPH, Oslo, within 72 hours of collection
Laboratory quality	≥80% of specimens have isolation and typing results ≤28 days of arrival ≥80% of poliovirus isolates characterized, including sequencing, within ≤60 days of paralysis onset

2.2 Laboratory analyses

All stool specimens collected as part of the AFP surveillance system are analyzed at the National Polio Reference Laboratory (NPL) at the NIPH.

The NPL has been WHO accredited since 1990 and is also accredited by the Norwegian Accreditation Agency according to ISO/IEC 17025. The NPL has achieved full score in the proficiency testing organized by WHO Regional laboratory in the Netherlands resulting in re-accreditation every year. NPL also participates in other external quality control schemes e.g. Quality Control for Molecular Diagnostics (QCMD), which is an independent International External Quality Assessment (EQA) / Proficiency Testing (PT) organization and United Kingdom National External Quality Assessment Service for Microbiology, operated by Public Health England.

If a laboratory in Norway isolates poliovirus (PV) or PV cannot be excluded by molecular diagnostics regardless of source (clinical cases of poliomyelitis, within the enterovirus surveillance system as described in paragraph 2.3 below, environmental sample or other), the laboratory shall immediately send the isolate to the NPL.

All poliovirus isolates shall be sent to the WHO Regional Reference Laboratory at the National Institute for Health and Welfare (THL) in Helsinki, Finland or to the National Institute for Public Health and the Environment (RIVM), the Netherlands for confirmation and intratypic differentiation (ITD) to determine if the virus is wild or vaccine related.

2.3 Supplementary surveillance of enterovirus infections

AFP surveillance is considered the gold standard for polio surveillance, but can be supplemented by diagnostic testing for enterovirus in patients with aseptic meningitis, encephalitis or other neurological (non-AFP) symptoms for polio.

Enterovirus surveillance in Norway is dependent on clinical diagnostic practices and diagnostic testing at local microbiology laboratories. Notification to MSIS is mandatory for all cases of enterovirus associated meningitis or encephalitis. Microbiological laboratories are obliged to forward diagnostic specimens for reference testing at the National Reference Laboratory for Enteroviruses, which is the NPL at NIPH. The number and types of specimen to be sent to the reference laboratory is according to the specified requirements of the NPL.

Stool samples from patients with confirmed enterovirus (EV) positive meningitis, encephalitis, acute flaccid myelitis or AFP are referred to the NPL for isolation and further typing and characterization. In addition, the NPL receives other types of EV-positive specimens from cases suffering from hand foot and mouth disease, febrile or sepsis-like illness in young children, respiratory disease etc.

The NPL has provided panels for external quality control for EV diagnostics for all the Norwegian microbiological laboratories through a program for proficiency testing in virology that has been running at the NIPH since 1982.

2.4 Environmental surveillance

Environmental surveillance on sewage is not currently performed in Norway. In 2015 the WHO released an updated manual on environmental surveillance. Norway is a low-risk country, and the guidelines for environmental surveillance are not applicable in the current situation. An official statement on the potential use of environmental sampling in Europe is awaited from the ECDC.

3 Containment of wild polioviruses in laboratories

The NPL is adhering to the WHO guidelines for PV containment as stated in the Polio Eradication and Endgame Strategic Plan 2013–2018 (www.euro.who.int/polioviruscontainment), particularly the "Guidance for non-poliovirus facilities to minimize risk of sample collections potentially infectious for polioviruses". Samples potentially containing infectious WPV or VDPV collected during the time period that polio still was in circulation in our country have been destroyed. Nationwide survey was conducted by the NIPH first in 2001 and later in 2015 to assess whether PV or potential PV infectious material was stored in other laboratory facilities. All Norwegian laboratories responded to the survey and reported that such material was not kept in their facilities.

4 Actions in the event of a suspected case of poliomyelitis

Suspected cases of poliomyelitis includes:

- Acute, flaccid paralysis in persons <15 years of age (including recently deceased) with any of the following risk factors (AFP "hot case"):
    - <3 OPV doses or <3 IPV doses
    - Recent travel to an endemic area
    - Belonging to a high-risk group (see 1.2)
- Clinical poliomyelitis-like illness in a person of any age.

As described in the Country Background section, approximately 60 infectious diseases are notifiable to the Norwegian Surveillance System for Communicable Diseases (MSIS), including poliomyelitis. In addition early warning notification in individual cases or outbreaks of certain infectious disease are to be sent immediately. A suspected or laboratory confirmed polio case will constitute such an early warning. In such a case doctors, laboratory personnel, nurses, midwives or public health nurses who suspect or detect a case of poliomyelitis are obliged to immediately contact the local Municipality Medical Officer. The Municipality Medical Officer will immediately notify the NIPH and the County Physician. If the Municipality Medical Officer is unavailable, the NIPH should be notified immediately via the on-call NIPH medical officer. A suspected case of polio as defined above are to be reported immediately to the local Municipality Medical Officer.

Initial steps to be initiated in case of a suspected polio case:

1. The Municipality Medical Officer will perform a detailed case investigation as outlined in paragraph 2.1 in the *Outbreak Preparedness and Response Plan* below.
2. Two stool samples taken 48 hours apart and within two weeks of onset are to be collected from all suspected cases. Samples are to be sent to the NPL at NIPH as soon as possible and within 24 hours. This is the responsibility of hospital staff if the suspected case is admitted, or the Municipality Medical Officer if the patient is not admitted to a hospital.
3. Stool samples should also be taken from household and / or hospital contacts and sent to the reference laboratory. This is the responsibility of the Municipality Medical Officer.
4. Appropriate community case finding is to be initiated by the Municipality Medical Officer following information from the detailed case investigation.
5. As part of the detailed case investigation, vaccination status for the case(s), all contacts and the immediate community will be established.
6. Vaccine will be provided to unvaccinated close (household / health providers) contacts. This will be performed within the municipality, but vaccines will be delivered free of charge from NIPH.

These initial steps partly overlap with the measures taken for a laboratory verified poliovirus case, as described in paragraphs 2 and 3 in the *Outbreak Preparedness and Response Plan* below.

If laboratory analyses confirm the suspected case to be infected with poliovirus (regardless of type), switch to the *Polio Outbreak Preparedness and Response Plan* below.

POLIO OUTBREAK PREPAREDNESS AND RESPONSE PLAN

1. Management and accountability

1.1 Management structure

According to the National Health Preparedness Plan (see Country Background paragraph for details) the overall responsibility for preparedness in all health-related emergencies rests with the Ministry of Health. On delegation the Norwegian Directorate of Health is responsible for the coordination of all health resources in the case of a health emergency, and so also in the case of a polio outbreak. The NIPH is the national expert body where the specific knowledge on control, surveillance and management of communicable diseases outbreaks including polio, will be found. According to the preparedness principles described in the National Health Preparedness Plan (closeness, similarity, lowest possible level), the NIPH will be the national operational focal point in the case of a polio outbreak. NIPH is also the focal point for IHR and EWRS.

The NIPH has its own Outbreak Surveillance Unit with weekly meetings were matters regarding both international and national outbreak warnings are assessed and discussed. At any given time there is a NIPH Medical Officer on call to receive alerts and inform and give advice in the case of an outbreak of national concern. This on call Medical Officer is part of the Outbreak Surveillance Unit. The Outbreak Surveillance Unit and the on call NIPH Medical Officer will advise, help coordinate and sometimes assist directly the infection control measures taken by the local Municipality Medical Officers.

Norway has no specific polio eradication committees given the epidemiological situation of Norway. In the case of a polio event or outbreak this will be managed within the existing health emergency preparedness structures and infection control organization, as described in the National Health Preparedness Plan and this plan.

Polio expertise within the NIPH is maintained by personnel at

Department of Vaccine Preventable Diseases

- Dr Didrik F. Vestrheim, Department Director
- Marianne Bergsaker, National Programme Coordinator
- Are S. Berg, National Programme Coordinator

National Polio Laboratory

- Dr Susanne G. Dudman, Head National Polio Laboratory
- Sanela Numanovic, National Polio Containment Coordinator

1.2 Definition and confirmation of a polio outbreak or event

Norway is obliged to notify WHO about any detection of WPV or VDPV immediately on the grounds that it could be an “event that may constitute a public health emergency” in accordance with IHR (*Statement on the Seventh IHR Emergency Committee meeting regarding the international spread of poliovirus. 26 November 2015. http://www.who.int/mediacentre/news/statements/2015/ihr-ec-poliovirus/en/*). Notification will occur at the first indication of a positive sample, regardless of type of isolate (environmental or clinical isolates) and this notification will not await intratypic differentiation (ITD) by the GPLN reference laboratory.

A poliovirus event or outbreak is defined in detail in the GPEI polio outbreak SOP[1].

In short and adjusted for Norway (no vaccine production facility, OPV not available within the country, containment of potential infectious material as previously described)

an **event** is defined as:

- human cases: detection of VDPV in one or more case with no evidence of transmission, Sabin like 2 isolate from individual sample(s),
- environmental samples: detection of WPV single environmental sample without follow-up evidence of virus excretion, VDPV without evidence of further transmission, or Sabin like 2 isolate from environmental sample(s),

and an **outbreak** is defined as:

- human cases: detection of any WPV infected individual(s) or any circulating (c)VDPV infected individual(s),
- environmental samples: detection of two or more separate environmental samples positive for WPV with genetic sequencing information indicating sustained local transmission, a single environmental sample positive for WPV with follow-up evidence of virus excretion.

A polio event may be escalated to an outbreak at any point in the investigation as deemed necessary by the WHO in consultation with the country and other GPEI partners.

The confirmation of an outbreak is the responsibility of the WHO regional office, and they will do so in consultation with Norwegian authorities. The Ministry of Health will be the overall decision making body, but will do so in close consultation with polio expertise at the NIPH (see 1.1) as well as GPLN laboratory experts, after taking into account the laboratory result (genetic sequencing), final case investigation (to rule out iVDPV) and event investigation.

1.3 Notification

Notification of health emergencies that are of concern of the public health are regulated under the national "IHR regulation" (*Forskrift om varsling av og tiltak ved alvorlige hendelser av betydning for internasjonal folkehelse, 2008*). The NIPH is responsible for the polio surveillance at a national level, and will further notify:

Nationally:

- The Ministry of Health, beredskap@hod.dep.no
- The Norwegian Directorate of Health, beredskap@helsedir.no, which will notify County Medical Officers and Municipality Medical Officers, and Regional Health Authorities depending on location, size and type of outbreak or event.
- All AFP contacts at pediatric wards in Norwegian hospitals.

Internationally:

- The WHO regional office trough the IHR focal point
- The European Commission Early Warning Response System (EWRS)

NIPH is the IHR national focal point in Norway, and will inform WHO regional office within 24 hours after confirmation of a detected case of polio. This time line also applies for notification to EWRS, the Ministry of Health and the Norwegian Directorate of Health.

Contact details for IHR focal point: utbrudd@fhi.no, +47 21076348.

Notification procedures for all types of outbreaks are described in the NIPH internal procedure *Epidemi 020.*

1.4 Notification to WHO

See 1.3

1.5 Declaration of the outbreak as a 'National public health emergency'

Following the confirmation of a poliovirus **outbreak**, The Norwegian Ministry of Health will declare the outbreak as a National public health emergency.

1.6 Response operation decision

According to the National Health Preparedness Plan, the overall coordination of the national crisis management will be lead from the Norwegian Directorate of Health on delegation from the Ministry of Health, see 1.1 and Country Background.

Furthermore and in accordance with the National Health Preparedness Plan, the operational responses will be conducted by the NIPH (see 1.1), in close contact with GPEI partners as described in the GPEI polio outbreak SOP[1]. The initiation of response operations will be done the same or the following day after laboratory confirmation of the polio case is received at the NIPH.

In accordance with NIPH's overall Preparedness Plan (internal procedure number BE-EH-PO-001) an internal crisis group will be appointed by the NIPH Director, and established with members from the Department of Vaccine Preventable Diseases, the Outbreak Surveillance Unit, the National Polio Laboratory, the Communications Department and other Departments if necessary. This internal crisis group will usually be led by the Department Director, Department for Vaccine Preventable Diseases. This internal crisis group will establish an Emergency Operations Centre (EOC) in the Outbreak Surveillance Unit`s "outbreak room", and perform their work in accordance with NIPH's overall Preparedness Plan. Contact details for this crisis group will be the same as the IHR focal point: utbrudd@fhi.no, phone +47 21076348.

1.7 Emergency Operation Centre (EOC) or Polio Control Room (PCR)

See 1.6

1.8 Partner coordination

Partner coordination will be lead from the Norwegian Directorate of Health, and in close contact with the NIPH.

1.9 Communication and media management

Communication and social mobilization will be handled through the established channels and with the help of media, and in accordance with internal and national Preparedness Plans.

The overall plan for media management will be coordinated from the Norwegian Directorate of Health. The internal crisis group at the NIPH will develop a communication plan regarding operational decisions, adapted to the size, the type and the spread of the event or outbreak.

Official websites of both Ministry of Health, the Norwegian Directorate of Health and NIPH will be used actively to inform the public. Social media can be used in addition. The webpages are intended for health personnel, media and the general population.

1.10 Vaccine registration, procurement and logistics

The NIPH handles procurement and logistics for all vaccines that are offered through the public health system, including all polio vaccines. Vaccines are purchased on a national basis, shipped to a central vaccine store at the NIPH in Oslo and distributed to all the municipalities and their public health centres. The cold chain is maintained throughout the shipment. Registration of vaccination is maintained through mandatory registration in SYSVAK, also organized within the NIPH.

In the case of a polio event or outbreak where additional immunisation activity is warranted, additional polio vaccination, registration of vaccination, procurement and logistics will be handled within the existing national system coordinated from the NIPH.

NIPH are maintaining a stock-pile for polio containing vaccines. A Nordic collaboration on preparedness for vaccine availability and virtual stock-piling ensures supply in case of vaccine shortage in a national outbreak situation.

1.11 Procurement of vaccine and logistics

See 1.10

1.12 Funding and resources

The resources needed for outbreak response operations will be available by regular funding.

2 Risk assessment

2.1 Detailed case investigation

The Municipality Medical Officer(s) in the affected municipality(-ies) where the case(s) or environmental samples are found will be responsible for the local case investigations.

The crisis group at the NIPH, which will include epidemiologists, will support the local case investigation, and coordinate the national surveillance and investigation, see 1.1 and 1.6 for contact details.

If needed, a field epidemiology team from NIPH can be deployed to affected municipalities to assist the local Medical Officers. The detailed case investigation will commence at the time a suspected case of polio is detected, at the latest within 24 hours.

The detailed case investigation will include a detailed clinical, epidemiological and social investigation of the case and contacts. In each case the following are to be investigated thoroughly:

- Clinical history including signs or symptoms of primary immunodeficiency
- Health facilities visited
- Travel history
- Social environment and the community context of the case

2.2 Event or outbreak, and grading of an outbreak

Norwegian authorities, WHO and GPEI partners will conduct a risk assessment for every **event** based on the findings of the epidemiologic (detailed case investigation) and laboratory investigations, and the strength of evidence. The risk assessment aims to characterize virus transmission and the implications for its further spread.

The ultimate decision of whether to designate a poliovirus isolate as an **event** or **outbreak**, for the purposes of the response described below, rests with the WHO in dialogue with the Norwegian Directorate of Health (coordinating national responses) and in close consultation with the NIPH (operational responses).

In case of an **outbreak** the crisis group at the NIPH will be the national focal point for grading of the outbreak in coordination with the GPEI's Eradication and Outbreak management group (EOMG). The grading will be performed within 72 hours of confirmation of the outbreak. Grading the outbreak from grade 1 to 3 depending on the potential for transmission within the country and beyond national borders, will rest upon:

- Information from the detailed case investigation (from which community the positive polio sample originated, the case(s) travel history, etc.).
- Population immunity in the affected area assessed through the use of the mandatory national electronic immunizations registry and from data collected in the detailed case investigation.
- The existence of vulnerable populations in the community (recently arrived refugees/migrants, other minority groups).
- Type and classification of the poliovirus.

Norway's health infrastructure, its capacity to mobilize human resources and the security situation, is solid and stable. This will be taken in to consideration when the EOMG will grade the outbreak.

3 Response plan

3.1 Development of detailed response plan following an outbreak or event

As previously described, the overall coordination of the outbreak or event will be led by the Norwegian Directorate of Health, while the detailed response plan as detailed in the following paragraphs will be developed by the crisis group at the NIPH. This will be performed in close contact with WHO and other GPEI-partners, and the Directorate of Health will be consulted.

With advice from NIPH, the municipality medical officers will be responsible for steps taken in the community, while local AFP contacts at the hospitals will be executing the steps taken in the hospitals.

See also 6. Activity calendar

3.2 Active case search

Initial steps in both the case of an event and an outbreak:

1) Detailed case investigation as outlined in 2.1. (to be initiated within 24 hours of laboratory notification)

2) Community case finding: (to be initiated within 24 hours of laboratory notification)

    a) Visit and document all health-care providers in the area, including private practitioners as part of active case search.

    b) Also in the case of a positive environmental sample active case finding is started in the suspected community and/or catchment area of the environmental surveillance site.

3) Contact sampling of case(s) (stool sampling): (to be initiated within 24 hours of laboratory notification)

    a) Collect one stool sample from at least five direct contacts (i.e. siblings, household contacts, playmates) as well as from at least 20 persons of the same age group living in the same community.

    b) Collect additional environmental samples and also community stool samples in case the new VDPV is from an environmental source.

4) Assessment of immunity: (to be initiated within 24 hours of laboratory notification)

    a) As part of the detailed case investigation, vaccination status for the case(s), all contacts and the immediate community will be established.

    b) Routine immunization coverage in the greater community (municipality, region or national level) will be investigated with the use of the mandatory national electronic immunizations registry (SYSVAK) at the NIPH.

3.3 Enhanced surveillance

Steps in the case of an **event and an outbreak:**

1) Enhanced AFP surveillance: (to be initiated within 72 hours of laboratory notification)

    a) Strict attention to completeness and timeliness of all AFP reporting is ensured through weekly follow up of the local AFP contacts from the national AFP coordinator (located at the Norwegian Surveillance System for Communicable Diseases, NIPH).

    b) All AFP contacts will be responsible for retrospective case search with the use of the hospitals Electronic Patient Journal (EPJ) system. The last 6-12 months prior to the case is to be searched.

    c) Routinely contact sampling for AFP cases (three contacts for every AFP case) from the geographical area for a period of time will be considered.

2) Enhanced supplementary laboratory surveillance (to be initiated within 72 hours of laboratory notification):

    a) All virology laboratories will be informed about the situation.

    b) All virology laboratories will be contacted to obtain any recent or pending enterovirus isolates/samples for further analysis at the NIPH.

3) Environmental surveillance:

    1) For the immediate investigation period, environmental surveillance will be considered.

    2) For the longer-term analyses, GPEI will be consulted about establishing or expanding local environmental sampling sites in the affected area.

Additional steps in the case of an **outbreak**:

1. Enhance AFP surveillance to an annualized rate greater than three non-polio AFP cases per 100 000 children younger than 15 years of age for the duration of the outbreak and for at least six to 12 months after the last case.

2. Expand contact sampling for all AFP cases in all “infected” and “immediate” transmission risk zones until the end of the outbreak.

3.4 Laboratory capacity strengthening

Key steps to be taken to enhance national polio laboratory capacity to deal with the increased workload caused by the outbreak include additional staff to organise contact sampling, analyse stool surveys and conduct supplementary surveillance e.g. expansion of the AFP and enterovirus surveillance and environmental surveillance. In the case of need for environmental surveillance, the NIPH has an agreement with the WHO Regional Reference Laboratory at the National Institute for Health and Welfare (THL) in Helsinki, Finland, for analyses of environmental samples there.

The focal point for coordinating this activity is the head of the NPL in close collaboration with the head of Department of Virology at NIPH.

All poliovirus isolates shall be sent to the WHO Regional Reference Laboratory at the National Institute for Health and Welfare (THL) in Helsinki, Finland or to the National Institute for Public Health and the Environment (RIVM), the Netherlands for confirmation and intratypic differentiation (ITD) to determine if the virus is wild or vaccine related.

3.5 Immunization responses

1. Close contacts will be vaccinated with IPV immediately regardless of vaccination status in both the case of an event or an outbreak.
2. Additional vaccination in the local community of the case(s) will be considered following the assessment of immunity as outlined in 3.2. At-risk populations and childcare institutions (school, nurseries etc.) will be considered for supplementary immunization.
3. Depending on the epidemiological circumstances supplementary immunization activity on municipality, regional or other sub-national levels or in specific age groups or socioeconomically defined groups will be considered.
4. Large scale supplementary immunization responses (SIAs): Specific steps for such SIAs are defined according to the isolate identified, and are described in detail in table 4 (events) and table 5 (outbreaks) of the GPEI Standard Operating Procedure[1]. SIAs are primarily warranted in high transmission risk scenarios. With the current high level of IPV vaccine coverage and long history free from any polio events or outbreaks, the likelihood of a high risk transmission scenario in Norway is low. Hence, large scale SIAs are not further addressed in this plan, but would need to be implemented as detailed in the GPEI SOP[1] if the transmission risk in Norway is altered towards higher risk.
5. Immunization system strengthening: following a polio event or outbreak, the current advice that all citizens should be vaccinated against polio and receive a booster dose every 10 years, will be repeatedly broadcasted as part of the communication plan.
6. Vaccination of travellers: As part of the communication plan the need for an updated international vaccination certificate before international travel will be broadcasted to the general public. Norwegian municipalities have a system for vaccination of travellers today, and these facilities are equipped with international vaccination certificates.

3.6 Immunization system strengthening

See 3.5

3.7 Vaccination of travellers

See 3.5

3.8 Polio case management

All polio cases will be treated within the public health system, and general infection control measures will be taken in every case. All health personnel involved in the treatment of polio virus cases will be assessed regarding IPV coverage.

For long term excretors, and especially cases of immunodeficient patients with VDPV (iVDPV), special measures must be taken. These measures will include the containment and destruction of feces for the time the patient excretes virus. Stool samples will be collected on at least monthly basis until three consecutive samples are negative.

Environmental sampling from the sewage downstream from both health facilities treating polio virus cases and homes of long-term excretors will be considered.

4 Response to poliovirus type 2 outbreaks or events post-switch

4.1 Response

Following eradication of WPV2 in 2015, a globally synchronized and successful switch from trivalent to bivalent OPV took place in 2016. After this switch the detection of any type 2 poliovirus (wild, vaccine-derived, or Sabin) in any sample from any source is generally considered to be a global public health emergency, and a specific SOP[2] for responding to a poliovirus type 2 event or outbreak has been developed by GPEI.

In Norway, with a high IPV vaccination rate, no use of OPV for many years and no laboratory or manufacturing site with poliovirus 2 material, the risk for a type 2 event or outbreak is low. In Norway's current epidemiological situation the actions following the detection of a type 2 poliovirus isolate will be the same as those required for any polio event or outbreak, as outlined above.

[2] GPEI Standard Operating Procedures: *Responding to a poliovirus event or outbreak, part 2: Protocol for poliovirus type 2*, http://www.polioeradication.org/Resourcelibrary/Resourcesforpolioeradicators/Technicalguidelines.aspx

5 Assessment of the response and documenting interruption

5.1 Outbreak or event assessment

For both an event and an outbreak the same concept for monitoring and assessment of the response quality will be used.

An independent outbreak response assessment (OBRA) team will be established within two weeks of the event/outbreak. This team will consist of the National Certification Committee for AFP surveillance, and will be coordinated from the NIPH.

The event and outbreak response quality will be monitored approximately every 3 months, and will be reported to the NIPH and the regional WHO office.

The outbreak response assessment will consist of:

- Assessment of the enhanced surveillance and that this meets the sensitivity criteria outlined in paragraph 3.3.
- Assess if the laboratory capacity strengthening is adequate as outlined in 3.4.
- Assess if the immunisation responses initiated are adequate as outlined in 3.5.

5.2 Documentation of interruption

The outbreak may be closed if:

- At least six months have passed without detection of any new poliovirus isolates from any source, AND
- there is evidence of high quality and adequate immunisation activity, AND
- There is evidence of sensitive surveillance.

If the two latter criteria are not fulfilled, 12 months (plus one month to account for the laboratory testing and reporting period from time of last isolate) must have passed without detection of any new poliovirus isolates from any source (conditional on all test results for the applicable period being available).

When these criteria are fulfilled, the OBRA team will report to NIPH and the WHO regional office. The WHO regional office will confirm the end of the outbreak based on the assessment report and recommendations. NIPH will report to the Norwegian Directorate of Health

6 Activity calender

6.1 Summary of key activities with timelines

The activity calendar may be printed out and used as a checklist. Provide with dates for when the activity is commenced.

Activity calendar for confirmed polio case, laboratory confirmed: _____ 20___

ACTIVITY		TIMELINE	RESPONSIBILITY	DATE
In both event and outbreak situations	***Additional activity in the case of an outbreak***			
A. Management and accountability measures				
Confirmation of a polio case and designation of the case as event or outbreak		Start point	WHO regional office in accordance with the NIPH	
	Grading of the outbreak	Within 72 hours	GPEI (EOMG) in coordination with NIPH	
	Declaration of the outbreak as a 'National public health emergency'	Within 24 hours	Ministry of Health	
Notification nationally and internationally		Within 24 hours	NIPH and the Norwegian Directorate for Health	
Initiation of response operations and establishing a crisis group/Emergency Operations Centre		Within 24 hours	NIPH	
B. Response operations				
1. Active case search:				
Detailed case investigation		Within 24 hours	Municipality Medical Officer	
Community case finding			Municipality Medical Officer	
Stool sampling of 5 close contacts and 20 age matched persons in same community			Municipality Medical Officer	
Immunity assessment of immediate community (case investigation) and greater community (SYSVAK)			Municipality Medical Officer	

2. Enhanced surveillance:		Within 72 hours		
- Weekly follow up of all local AFP contacts			NIPH	
- Retrospective case search			Local AFP contacts	
- Contact sampling of 3 contacts for each AFP case	- Expand contact sampling for all AFP cases		Local AFP contacts	
	- Enhanced AFP surveillance to annualized rate > 3/ 100 000		Local AFP contacts /NIPH	
- Contact all virology laboratories: enhanced supplementary laboratory surveillance and pending EV samples			NIPH	
- Consider environmental surveillance			NIPH in consultation with GPEI	
3. Strengthen NPL laboratory capacity			NPL, NIPH	
4. Immunization activity:		As soon as possible		
- Vaccinate close contact with IPV			Municipality Medical Officers	
- Vaccinate community, especially at-risk population and after immunity assessment			Municipality Medical Officers	
- Consider immunization system strengthening			Municipality Medical Officers	
C. Assessment of response and interruption				
Establish OBRA team consisting of National Certification Committee members		Within 2 weeks	NIPH	
Outbreak response quality monitoring		Every 3 months	OBRA team	
	Close outbreak when criteria fulfilled		OBRA team reports to NIPH and WHO regional office	

Published by the Norwegian Institute of Public Health
December 2018
P.O.B 222 Skøyen
NO-0213 Oslo
Telefon: + 47-21 07 70 00
The report can be downloaded as pdf
at www.fhi.no/en/publ/