

Risk of introduction and transmission of wild-type poliovirus in EU/EEA countries following events in Israel and Syria – updated risk assessment

December 2013

Main conclusions and recommendations

The confirmed circulation of wild-type poliovirus (WPV) in Israel and the outbreak of poliomyelitis in Syria mean that there is a high risk the disease will be reintroduced into the EU/EEA. The reintroduction and transmission of WPV in the EU/EEA Member States needs to be prevented.

Vaccination/prevention

- EU/EEA Member States should give high priority to the assessment of polio vaccination uptake at national, sub-national and local level, and to the identification of vulnerable and under-vaccinated populations.
- Countries where the overall national vaccination coverage is below 90% should increase efforts to improve vaccination coverage under the national schedule.
- The highest level of risk is posed by the proximity of low- or unimmunised population clusters to large populations vaccinated using IPV-only schemes. However, suboptimal hygiene and crowded living conditions may also play a role in facilitating the spread of infection. In particular, religious groups with contact to Israel; migrant residents visiting family and friends in countries where WPV is circulating; migrants coming from high-risk areas and vulnerable groups living in poor sanitary conditions are key risk groups. Countries with groups living in such conditions should urgently consider implementing targeted action and improving vaccine coverage in these groups.
- EU/EEA Member States should recommend that all travellers to areas where WPV is in circulation have an up-to-date polio vaccination status.
- EU/EEA Member States should recommend that all those in close contact with refugees from areas with WPV (including medical, social and humanitarian personnel) have an up-to-date polio vaccination status.
- EU Member States receiving refugees and asylum seekers from Syria and other areas where WPV is currently circulating should assess their vaccination status on arrival and provide polio vaccination and other vaccinations as needed.
- Regional and international efforts to assess the risk and provide vaccination and other public health services in Syria and to Syrian refugees hosted by neighbouring countries should be supported.

Surveillance

- AFP surveillance is considered the 'gold standard' for polio surveillance.
- Member States that do not meet the polio surveillance requirements established by the Regional Certification Commission for Polio Eradication should urgently consider strengthening their surveillance systems in order to at least comply with the minimum AFP surveillance standards, if this is the only surveillance system in place.
- Member States with pockets of unvaccinated individuals should consider strengthening or establishing environmental and/or enterovirus surveillance in these areas, as a complement to AFP surveillance.
- Member States should consider assessing their current laboratory capacity for poliovirus detection.

- The role of environmental and enterovirus surveillance should be further discussed at the EU/EEA-level with a view to agreeing on common standards and indicators. ECDC and the Member States, in close collaboration with WHO, should engage in the development of guidance for the establishment of environmental and enterovirus surveillance.
- An EU/EEA protocol should be developed on the systematic testing of people with aseptic meningitis, encephalitis or other neurological (non AFP) symptoms for polio.
- Countries hosting Syrian citizens in designated areas (camps) should assess the level of transmission of wild poliovirus among them. Such assessments can be carried out through enhanced clinical surveillance (e.g. AFP surveillance) and the strategic use of environmental surveillance.
- Routine enterovirus/poliovirus surveillance for asymptomatic refugees is not recommended.
- ECDC could assist with capacity-building of Member State polio surveillance systems by supporting training activities for environmental and other types of polio surveillance and by facilitating twinning arrangements for sample referral.

Preparedness

- Member States identifying positive environmental or enterovirus samples should be prepared to use WHO guidelines to assess WPV circulation in the affected areas.
- Member States that have not yet developed national response plans should develop these plans and consider requesting support from ECDC and WHO.
- In the event that positive human samples are detected, Member States should implement their national poliomyelitis response plan. In the unfortunate event that a national plan is not yet available, an emergency plan should be developed on the basis of WHO guidance and recommendations.
- Member States should undertake exercises to test their poliomyelitis response plans.
- Operational and contingency plans are needed in the EU/EEA for the possible mobilisation of IPV and OPV stockpiles in case of evidence of WPV transmission.
- The availability of poliovirus vaccines to be used in the context of an outbreak should be assessed.
- Taking into account the EU/EEA setting, IPV would be considered the first choice for most of the potential outbreak scenarios.
- In order to trigger an operational plan that necessitates the use of OPV, a national threshold for EU/EEA Member States should be defined in terms of number of positive sewage/stool samples, or geographical spread.
- Should a response with OPV be implemented, safety aspects have to be considered as a priority, and even then OPV should not be administered as a first dose.
- ECDC could play an active role in coordinating the exchange of preparedness plans and the sharing of best practices if circulating poliovirus is detected.

Source and date of request

ECDC internal decision.

Public health issue

In response to the recent circulation of wild-type poliovirus type 1 (WPV1) in Israel and the report of a cluster of acute flaccid paralysis (AFP) cases in Syria, ECDC published two risk assessments for the EU/EEA on 26 September and 23 October 2013 [1,2]. In addition, ECDC convened an expert consultation meeting on 5 November 2013 in Stockholm. The purpose of this meeting was to share expert views on how ECDC could support the EU/EEA Member States to best respond to the identified threat of wild-type poliovirus being re-introduced and transmitted in the EU/EEA. The final meeting report 'Expert consultation on scientific evidence linked to poliovirus in Israel and Syria, Stockholm, 5 November 2013' can be found here:

<http://ecdc.europa.eu/en/publications/Publications/Expert%20consultation%20mtg%20report%20-%20polio%20Israel%20Syria%20-%20final.pdf>

The purpose of this risk assessment is to share the latest available epidemiological information on the global polio situation, with a focus on the events in Israel and Syria; to summarise the two risk assessments conducted by ECDC presenting the assessed threat to the EU/EEA; to summarise the key discussions and recommendations from the expert consultation meeting held on 5 November 2013 and to present a single document bringing together all previous recommendations.

Consulted experts

ECDC staff (in alphabetical order): Elizabeth Bancroft; Paloma Carrillo-Santistevé; Denis Coulombier; Tarik Derrough; Assimoula Economopoulou; Johan Giesecke; Emma Huitric; Peter Kreidl; Pierluigi Lopalco; Irene Muñoz; Daniel Palm; Lucia Pastore Celentano.

Acknowledgements: experts contributing to technical discussions which took place on 5 November 2013.

Event background information

As of 27 November 2013, 347 cases of WPV1 have been reported worldwide compared with 202 for the same period in 2012 [3]. The majority of the cases in 2013 have been from non-endemic countries: to date, at least five countries that were non-endemic for polio in 2012 have had paralytic polio cases (Kenya, Somalia, Ethiopia, Syria and Cameroon) and another has had documented transmission of wild-type poliovirus (Israel). The emergence of polio in countries thought to be free of this virus is a stark reminder that polio can be introduced into any region with a susceptible population.

Outbreaks of polio in endemic and non-endemic countries may lead to a massive mobilisation of resources being required to control the disease. All of the countries with newly identified polio, and some surrounding countries, have had to implement substantial resources to identify cases, follow-up on contacts and provide vaccinations to high-risk populations. As of 4 December 2013, the outbreak of polio in Syria has resulted in the identification of 17 laboratory-confirmed cases from three different areas of the country, indicating widespread transmission of the virus. Consequently, a vaccination campaign is being conducted, targeting 22 million children over a period of 6–8 months in seven countries and territories [4]. Even though Israel has a high percentage of the population covered by inactivated poliovirus (IPV) vaccine (estimated to be at >95%), wild-type poliovirus transmission has been documented in environmental samples and stool samples between February and November 2013 (personal communication), although no paralytic cases have been documented. Even without paralytic cases, detection of poliovirus has resulted in the vaccination of up to one million children with oral polio vaccine (OPV) and Israel has recently re-introduced OPV into its vaccination schedule for children, despite having moved to an all-IPV schedule in 2005, as recommended by the Global Polio Eradication Initiative (GPEI) and WHO.

Migration from Syria to EU/EEA Member States

According to the Office of the United Nations High Commissioner for Refugees, as of December 2013, there are more than two million registered Syrian refugees, representing an increase of 700 000 since July 2013. Of these, 18.2% are children under the age of five [19]. From 1 January to 31 August 2013, ten percent of new asylum applications in the EU were from Syrian nationals.

Since 2012, there has been an increase of undocumented migrants from Syria entering the EU [22]. Syrians were mostly reported to enter the EU from the Aegean Sea and at the Bulgarian land border with Turkey. The majority of the undocumented migrants were either men travelling alone or families with end destinations in Germany and Sweden.

EU/EEA countries have experience of welcoming refugees/migrants from geographical areas where polio is endemic. Unlike refugees coming from other parts of the world, Syrian refugees may require specific attention at this time for the following reasons:

- Syria is geographically close to the EU with a relatively short-transfer time;
- Syria has a highly mobile population that may be entering the EU directly;
- there may not be an opportunity for immunisation prior to entry (e.g. in transit refugee camps);
- Syria has a population of children <5 years who may not be adequately, if at all, vaccinated against polio; and
- there is an ongoing outbreak of polio.

Implications of polio in Israel, Syria and elsewhere for the EU/EEA

The increase in the number of polio cases and the number of countries reporting poliovirus transmission increases the risk to the EU/EEA of the virus being reintroduced and transmitted in Member States. Mangal et al [9] foresaw the scenario that WPV could spread silently for long periods in a country with very high IPV immunisation coverage if some portion of the population lives in conditions where the virus transmits very efficiently (poor sanitation, predominantly faecal oral transmission). The situation in Israel is believed to correspond to these circumstances [10]. Israel has been able to detect the transmission of polio due to their extensive environmental surveillance.

In the EU/EEA, similar living conditions exist among specific population groups and a similar scenario could occur if poliovirus is re-introduced into the area. Nevertheless, in light of good water sanitation and waste water management and the fact that transmission of WPV is predominantly oral-to-oral, the EU/EEA Member States are more likely to see WPV circulation among population groups with low vaccination coverage rather than in the highly immunised population. If so, this may result in more clinical disease (paralysis, meningitis) than has been reported in Israel.

In response to the situation in Israel and Syria during the past five months, ECDC has issued two risk assessments on polio in 2013. The first was issued on 26 September as a result of the public announcement of the discovery of poliovirus in environmental samples in Israel.

The initial risk assessment from 26 September concluded that:

- 'based on the evidence, there is a risk of importation and re-establishment of WPV into the EU via a recently infected person shedding the virus, if we consider the significant population flow from and to countries where WPV is still circulating.'

The initial risk assessment also stated that:

'The overall threat posed by re-establishment of poliovirus into the EU/EEA ... [is]:

- Very low in OPV vaccinees for both poliovirus infection and disease;
- Moderate in IPV-only cohorts for poliovirus infection and low for disease; and
- High in low-or unvaccinated groups for poliovirus infection and moderate for disease.'

On 23 October, ECDC published a rapid risk assessment in relation to events in Syria, concluding that:

- '...this cluster of cases of AFP among Syrian citizens increases the risk for the importation of wild poliovirus to the EU/EEA and further re-establishment and transmission in Member States.'
- there was still a high risk of introduction and transmission and a moderate risk of disease.

Both risk assessments included recommendations for EU/EEA Member States to identify and control the transmission of polio, and all these recommendations are listed below.

Summary of expert consultation meeting on controlling poliovirus transmission in the EU/EEA

Given the increasing risk of poliovirus being reintroduced into the EU/EEA, on 5 November 2013, ECDC hosted a meeting of vaccine-preventable disease experts and polio experts from Europe and elsewhere in Stockholm to discuss how ECDC and the EU/EEA Member States should best respond to the identified threat of wild-type poliovirus being (re)introduced and re-established in Europe.

The discussions focused on the immediate arrival of refugees from Syria, and other areas where polio is currently circulating, into EU/EEA Member States and possible action to prevent poliovirus cases. The populations of interest included refugees/migrants from countries with circulating WPV or countries at risk of WPV outbreaks, as well as those having contact with these populations. The three most important areas of control for polio were also discussed: vaccination, surveillance and preparedness.

The expert group concluded that:

- refugees must be protected from poliomyelitis either before or at the port of entry into the EU/EEA;
- EU/EEA population groups in close contact with refugees must be protected from poliomyelitis;
- surveillance to detect WPV transmission and clinical cases must be enhanced.

The full report of the meeting 'Expert consultation on scientific evidence linked to poliovirus in Israel and Syria' can be accessed via the following link:

<http://ecdc.europa.eu/en/publications/Publications/Expert%20consultation%20mtg%20report%20-%20polio%20Israel%20Syria%20-%20final.pdf>.

The following is a summary of the key discussions and recommendations made during the expert meeting.

Vaccination

Refugees may arrive in the EU/EEA via different routes: they may have stayed in migrant camps prior to arrival in EU and thus have received OPV, or they may not have been through a migrant camp. They may or may not have documentation of previous vaccination. Due to the conflict in Syria, the vaccination programme has been disrupted since 2011, therefore those at highest risk of acquiring or transmitting poliovirus from that country will be children under the age of five years (those who have not received any polio vaccination or those who have not received a full course of vaccination).

The experts concluded that it is therefore considered top priority to ensure the vaccination of all children from Syria under five years of age against polio, unless the child has proof of vaccination. Host countries should also ensure that refugees (including children and adults) from all geographical areas have age-appropriate vaccinations, according to the host country's immunisation schedule. All missed vaccinations should be taken into account, not just polio. Serology testing pre-vaccination is not recommended.

An unresolved question relates to the use of IPV versus OPV in this population for a variety of reasons, including ease of administration, supplies and the risk of intramuscular injections while incubating polio. IPV is currently used for routine immunisation in the EU/EEA. However, there is evidence of an increased risk of paralysis developing in a limb in which an injection has been administered [25–27] if the child is incubating poliomyelitis at the time of the injection. An increased risk of developing vaccine-associated paralytic polio (VAPP) was observed in Romania following multiple intramuscular injections after OPV [28]. However, the same phenomenon was not observed in the US when injections were given simultaneously and therefore the authors of a US study concluded that it is safe to administer OPV simultaneously with other childhood vaccinations [29].

Polio circulation/infection may arise not only among Syrian refugees in the EU but also among unvaccinated or underserved EU population groups. Therefore, increasing coverage among the EU population, especially in under and un-immunised populations is critical and provides the first line of defence against poliovirus transmission and disease. All EU/EEA citizens who will be working directly with high-risk populations (medical personnel, social services personnel, host families, etc.) should be fully immunised against polio, as should travellers to endemic areas where poliovirus is circulating.

Surveillance

Early identification of poliovirus transmission is critical to the control of polio. Even one clinical case of polio in a polio-free area, such as the EU/EEA is an 'outbreak' and must be addressed swiftly in order to prevent further cases. Surveillance must be improved to detect possible cases of polio, to define the extent of circulation and to be able to confirm that wild poliovirus transmission is not occurring.

WHO considers surveillance for acute flaccid paralysis (AFP) to be the 'gold standard' for polio surveillance in endemic and polio-free regions. The Expert Group agreed that AFP surveillance should be strengthened in the EU/EEA to at least the minimum standard for AFP surveillance in polio-free regions: in 2012, only three of 20 EU/EEA countries that use AFP surveillance met the minimum standard [1]. AFP surveillance should be enhanced in those areas where migrants from countries with circulating poliovirus are settling, for example in cities and in reception and detention centres/refugee camps. While AFP surveillance has traditionally focussed on children under 15 years, consideration should be given to expanding AFP surveillance to other age groups as more information is known about the epidemiology of polio in the migrant groups and the immunity status of the host country population.

Surveillance with supplemental systems (environmental surveillance and enterovirus surveillance) should target those populations at high risk of either transmitting poliovirus (e.g. areas where refugees settle or in reception/detention centres) or at high risk of acquiring polio (e.g. areas that have an under- or unimmunised population).

The experts indicated that environmental surveillance is feasible and could serve as an early warning system for the detection of poliovirus when targeting areas where high-risk groups (refugees, under or un-immunised populations) reside, applied in accordance with 2003 WHO guidelines. However, at this time, the experts did not recommend the mass implementation of environmental surveillance given the cost and laboratory resources needed to develop such a programme.

The usefulness of screening stool samples from refugees for polio and the quarantining of those found to have positive samples was discussed at the expert meeting.

The group recommended against screening asymptomatic refugees for polio and quarantining for several reasons:

- the significant use of resources required to screen and quarantine refugees;
- the need for extended laboratory capacity to be able to distinguish between WPV and vaccine-derived polioviruses (VDPV) in stool samples (VDPV is anticipated to become more prevalent in refugees as vaccination programmes with OPV are increasingly being used in high-risk areas such as Syria);
- the stigmatisation of individuals or groups that may test positive;
- the limited duration of shedding; and
- the relatively high vaccination rate against polio in the EU/EEA population.¹

However, the experts recommended considering systematic studies of stool carriage in a refugee camp setting to better define the populations at greatest risk of incubating and transmitting poliovirus, or developing polio. The experts also recommended the development of an EU/EEA protocol to systematically test people with aseptic meningitis, encephalitis, or other neurological, non-AFP symptoms for polio.

Preparedness

A set of comprehensive guidelines on the response to the identification of poliovirus (wild-type or vaccine-derived) in Europe have been developed by WHO [30]. Member States should be prepared to review and enact these guidelines, adapting them to their national structures. A single case of polio in a polio-free region is an outbreak and must be responded to swiftly and comprehensively. Preparedness for response, as outlined in the WHO guideline mentioned above, includes identifying gaps in immunisation coverage in populations and sub-populations before polio is identified and being ready to initiate vaccine campaigns within four weeks of a case of polio being identified and to develop active AFP or other intensive surveillance.

The experts agreed with the WHO guidelines that there may be different responses to a positive environmental sample or a clinical polio case depending on the population affected (an imported case or an endemic case), the number of positive environmental samples (over time or space), and the vaccination status of the population from which the samples/cases were identified. For example, a clinical case of polio in a newly arrived (less than four days) refugee who has been housed in a highly-immunised population may require a different response than multiple positive environmental samples in an area with a low vaccination coverage. The experts felt that Member States should be encouraged to review their preparedness plans in light of their unique populations, resources and surveillance systems, taking into account the WHO guidelines. Given the increased risk of poliovirus being (re)introduced into the EU/EEA, Member States should update their response plans accordingly and ensure regular 'testing' of the plans through simulation exercises.

During the discussions, the choice of vaccine was thoroughly discussed. According to the experts, IPV would be considered the first choice for response in most of the potential outbreak scenarios in EU/EEA Member States. Furthermore, it was highlighted that in order to trigger an operational plan that necessitates the use of OPV, a threshold should be defined at national level, in terms of the number of positive sewage/stool samples or geographical spread. Should a response with OPV be implemented, safety aspects have to be considered as a priority and OPV should not be administered as a first dose. The conclusions of the experts slightly differed from the WHO guidelines on the response to the detection of wild poliovirus in the WHO European Region.

¹It is acknowledged that some EU/EEA Member States have begun to screen asymptomatic refugees for enterovirus/polio.

Conclusion and recommendations

The risk of (re)introduction and re-establishment of poliovirus in the EU/EEA is growing as the number of cases of poliovirus increases globally. The risk appears to be more acute in 2013 as poliovirus has been found circulating in countries geographically adjacent to Europe (Israel and Syria). Below are recommendations and options that EU/EEA Member States can take to reduce the risk of poliovirus transmission and disease in their citizens; they are taken from the two previous risk assessments issued by ECDC as well as the conclusions of the expert consultation meeting held in Stockholm on 5 November 2013.

The strategies are based on enhancing vaccination of resident and refugee populations, strengthening surveillance and being prepared to respond quickly to the identification of polio.

Vaccination/prevention

- EU/EEA Member States should give high priority to the assessment of polio vaccination uptake at national, sub-national and local level and to the identification of vulnerable and under-vaccinated populations.
- Countries where the overall national vaccination coverage is below 90% should increase efforts to improve vaccination coverage under the national schedule.
- The highest level of risk is posed by the proximity of low- or unimmunised population clusters to large populations vaccinated using IPV-only schemes. However, suboptimal hygiene and crowded living conditions may also play a role in facilitating the spread of infection. In particular, religious groups with contact to Israel; migrant residents visiting family and friends in countries where WPV is circulating; migrants coming from high-risk areas and vulnerable groups living in poor sanitary conditions are key risk groups. Countries with groups living in such conditions should urgently consider implementing targeted action and improving vaccine coverage in these groups.
- EU/EEA Member States should recommend that all travellers to areas where WPV is in circulation have an up-to-date polio vaccination status.
- EU/EEA Member States should recommend that all those in close contact with refugees from areas with WPV (including medical, social, and humanitarian personnel) have an up-to-date polio vaccination status.
- EU Member States receiving refugees and asylum seekers from Syria and other areas where WPV is currently circulating should assess their vaccination status on arrival and provide polio vaccination and other vaccinations as needed.
- Regional and international efforts to assess the risk and provide vaccination and other public health services in Syria and to Syrian refugees hosted by neighbouring countries should be supported.

Surveillance

- AFP surveillance is considered the 'gold standard' for polio surveillance.
- Member States that do not meet the polio surveillance requirements established by the Regional Certification Commission for Polio Eradication should urgently consider strengthening their surveillance systems in order to at least comply with the minimum AFP surveillance standards, if this is the only surveillance system in place.
- Member States with pockets of unvaccinated individuals should consider strengthening or establishing environmental and/or enterovirus surveillance in these areas, as a complement to AFP surveillance.
- Member States should consider assessing their current laboratory capacity for poliovirus detection.
- The role of environmental and enterovirus surveillance should be further discussed at the EU/EEA-level with a view to agreeing on common standards and indicators. ECDC and the Member States, in close collaboration with WHO, should engage in the development of guidance for the establishment of environmental and enterovirus surveillance.
- An EU/EEA protocol should be developed on the systematic testing of people with aseptic meningitis, encephalitis, or other neurological (non AFP) symptoms for polio.
- Countries hosting Syrian citizens in designated areas (camps) should assess the level of transmission of wild poliovirus among them. Such assessments can be carried out through enhanced clinical surveillance (e.g. AFP surveillance) and strategic use of environmental surveillance.
- Routine enterovirus/poliovirus surveillance for asymptomatic refugees is not recommended.
- ECDC could assist with capacity-building of Member State polio surveillance systems by supporting training activities for environmental and other types of polio surveillance and by facilitating twinning arrangements for sample referral.

Preparedness

- Member States identifying positive environmental or enterovirus samples should be prepared to use WHO guidelines to assess WPV circulation in the affected areas.
- Member States that have not yet developed national response plans should develop these plans and consider requesting support from ECDC and WHO.
- In the event that positive human samples are detected, Member States should implement their national poliomyelitis response plan. In the unfortunate event that a national plan is not yet available, an emergency plan should be developed on the basis of WHO guidance and recommendations.
- Member States should undertake exercises to test their poliomyelitis response plans.
- Operational and contingency plans are needed in the EU/EEA for the possible mobilisation of IPV and OPV stockpiles in case of evidence of WPV transmission.
- The availability of poliovirus vaccines to be used in the context of an outbreak should be assessed.
- Taking into account the EU/EEA setting, IPV would be considered the first choice for most of the potential outbreak scenarios.
- In order to trigger an operational plan that necessitates the use of OPV, a national threshold for EU/EEA Member States should be defined in terms of number of positive sewage/stool samples, or geographical spread.
- Should a response with OPV be implemented, safety aspects have to be considered as a priority, and even then OPV should not be administered as a first dose.
- ECDC could play an active role in coordinating the exchange of preparedness plans and the sharing of best practices for action if circulating poliovirus is detected.

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