PALESTINE
Anticipated impacts of a polio outbreak in Gaza

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Briefing note
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KEY MESSAGES

- **Gaza is facing a high risk of polio outbreak** after vaccine-derived poliovirus type 2 (cVDPV2) was detected in sewage samples collected on 23 June 2024 (WHO 23/07/2024 and 27/07/2024; GPEI 19/07/2024). The presence of cVDPV2 in two of Gaza's governorates indicates continuing, potentially widespread transmission (Science 22/07/2024). Without a quick and thorough response, the WHO considers the further spread of cVDPV2 in Gaza and internationally to be a high risk (WHO 23/07/2024).
- **Severe access constraints and a decimated health system will hamper effective, widespread vaccination, monitoring, surveillance, and care for those who contract polio** (UN News 30/07/2024). While there were no reported cases of poliovirus-induced paralysis by 23 July, there may be undetected cases, as access constraints have prevented adequate disease surveillance in Gaza since October 2023 (WHO 23/07/2024; Science 22/07/2024).
- **Polio infections will, in particular, place increased health stress on children,** who are already suffering from high levels of acute malnutrition, conflict-induced injury, mental health and psychosocial problems, acute respiratory infections, diarrhoeal diseases, and other humanitarian needs resulting from constant conflict and displacement (Nutrition Cluster 26/07/2024; Health Cluster 22/07/2024). Many children under two in Gaza have not been fully vaccinated against polio (OCHA 29/07/2024).

About this report

Aim: this analysis identifies risks posed by a potential polio outbreak, particularly for children, and analyses major constraints in the health and humanitarian response.

Methodology and limitations: this analysis is based on a secondary data review. There has been limited to no information on disease prevalence and immunisation rates in Gaza since 7 October 2023 because of severe access constraints.

Terminology: polio (poliomyelitis) is a highly infectious disease caused by the poliovirus. The **oral polio vaccine (OPV)** has been effectively used since 1988 to reduce **'wild' poliovirus** cases, which, by July 2024, remained endemic only in Afghanistan and Pakistan (WHO 24/10/2023; GPEI accessed 29/07/2024). The OPV contains a weakened, live poliovirus and is cheaper and more effective at preventing poliovirus transmission than the inactivated polio vaccine. When OPV recipients excrete the weakened virus in communities with low immunisation rates and poor sanitation, however, it can mutate and infect people who are not immunised. This can lead to the emergence of **circulating vaccine-derived poliovirus types 1 and 2** (cVDPV1 and cVDPV2), which are particularly common in conflict and hazard-affected contexts (Gavi 28/07/2022; GPEI accessed 26/07/2024 b; Nature 14/06/2023; Cooper et al. 11/10/2021).

BACKGROUND AND DRIVERS

The Global Polio Laboratory Network identified six circulating variants of cVDPV2 in sewage samples collected in Deir al-Balah and Khan Younis governorates. The variants may have been introduced into Gaza as early as September 2023, and are related to a poliovirus variant that circulated in Egypt in December 2023 (WHO 23/07/2024 and 27/07/2024; BBC 23/07/2024; Science 22/07/2024; GPEI 19/07/2024).

Extensive damage to WASH and health infrastructure has created conditions conducive to rapid polio transmission. Polio is spread through the faecal-oral route, either directly from person to person, or less frequently through contaminated water or food (WHO 24/10/2023). By 26 June 2024, 70% of sewage pumps and 100% of wastewater treatment plants in Gaza

had been destroyed and sewage was flooding the streets of towns and IDP camps across Gaza, exposing people to dangerous bacteria, viruses, fungi, and other pathogens (Oxfam 18/07/2024).

Escalating conflict and frequent, repeated displacements have also increased the likelihood of rapid disease transmission in overcrowded IDP sites with minimal access to WASH and healthcare. Around 1.9 million IDPs (over 80% of Gaza's population) have been forced into overcrowded sites in small areas of Gaza (an estimated 17%) where Israeli forces have yet to issue evacuation orders or declare 'no-go zones' (UNRWA 24/07/2024). There is minimal access to WASH facilities in IDP sites (IRC/MAP UK 22/05/2024).

ANTICIPATED IMPACTS IN GAZA

Severe illness, disability, and death

While many polio infections (around 70%) cause no symptoms or only mild illness (around 25%), approximately one in 200 infections (0.5%) cause irreversible paralysis within hours (ECDC 28/11/2023; WHO 24/10/2023; GPEI accessed 26/07/2024 a). Given the widespread destruction of Gaza's healthcare system, people who develop the more severe, paralytic disease will likely have no access to treatment to alleviate symptoms, including antispasmodic drugs and physical therapy (GPEI accessed 26/07/2024 c). Survivors will require wheelchairs, crutches, and other mobility aids, which are already difficult to obtain and maintain in Gaza (HelpAge 05/07/2024; OCHA 01/05/2024; GPEI 12/12/2017).

Polio-induced paralysis is fatal in 5–10% of cases (WHO 24/10/2023; GPEI accessed 26/07/2024 a). Public health projections for February–August 2024 estimated that a wild-type or vaccine-derived polio outbreak would cause 1,145–2,444 deaths in Gaza, making it the second highest epidemic-related mortality threat in the enclave, after cholera (3,595–8,971 deaths) (Johns Hopkins et al. 19/02/2024).

Higher risks for children

Children, particularly those under five and unvaccinated children, are at high risk of contracting polio (MSF accessed 31/07/2024).

Many children under two in Gaza have not been fully vaccinated against polio (OCHA 29/07/2024). Polio vaccination coverage was estimated at 86% in Gaza before 7 October 2023. Rates have likely decreased significantly since then, as the outbreak of conflict and resulting decimation of the health system have prevented the immunisation of children with initial and follow-up OPV doses (BBC 23/07/2024; WHO 01/08/2024).

The many malnourished children in Gaza are also at high risk of contracting polio. Malnutrition weakens children's immune systems and can decrease the effectiveness of vaccine response, including polio vaccine response, and increase the risk of severe polio disease (Morales et al. 19/12/2023; Gavi 02/11/2020; IFRC 28/06/2022). In June 2024, an estimated 346,000 children under five in Gaza were at risk of malnutrition. Of these children, 50,400 are expected to experience acute malnutrition and 10,000 are expected to face severe acute malnutrition by the end of 2024 (Nutrition Cluster 26/07/2024).

Current and anticipated response constraints

Without improved humanitarian access, many (if not all) of the polio vaccines, test kits, and other supplies necessary to containing an outbreak will remain stuck in trucks at border crossings and checkpoints (UN News 30/07/2024).

On 26 July, the WHO announced that it would send over one million polio vaccines to Gaza for use in coming weeks (UN News 26/07/2024; WHO 01/08/2024). There is no publicly available information on the type of vaccines sent, when exactly they will arrive, and where or how they will enter Gaza. Up until 29 July, humanitarian responders were reporting that high levels of insecurity, including almost constant bombardment and regular looting, had rendered the use of Kerem Shalom/Karam Abu Salem crossing logistically impossible (ACT Alliance et al. 30/07/2024; MSF 21/06/2024). The Rafah border crossing has remained closed since 7 May, leaving, by 22 July, Erez West and the rarely-used Gate 96 in northern Gaza as the only entry points for humanitarian aid (OCHA 29/07/2024; TOI 30/05/2024; ETC/WFP 22/07/2024; TNH 22/07/2024).

Insecurity, checkpoints, fuel shortages, and frequent Israeli evacuation orders impede the internal movement of aid that does enter Gaza (UN News 26/07/2024; ACT Alliance et al. 30/07/2024; ETC 22/07/2024). Since 7 October, these access restrictions have regularly prevented the delivery of medical supplies and medications to healthcare facilities (Health Cluster 22/07/2024). Limited fuel will also complicate efforts to store polio vaccines at an appropriate temperature (USAID 05/2022).

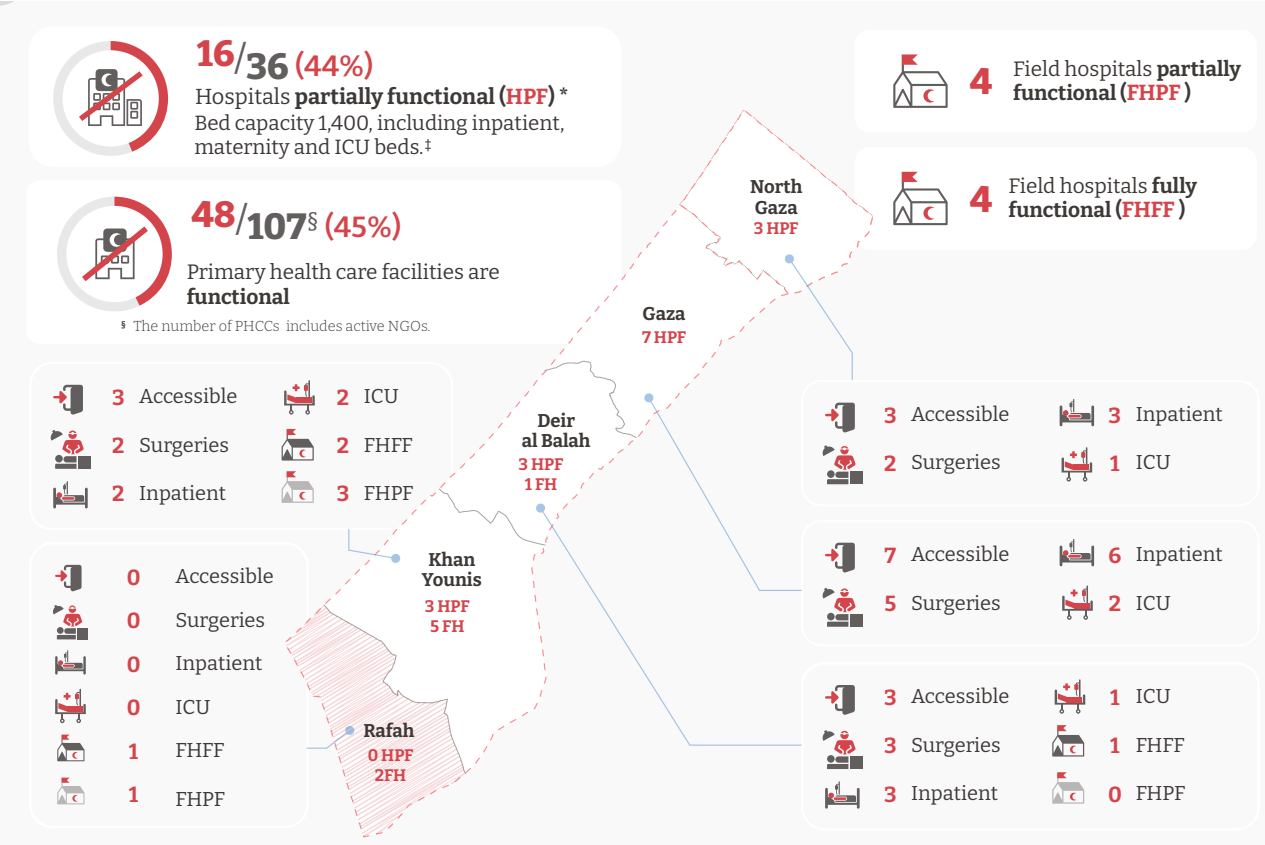
Even if vaccines and test kits enter Gaza, an overburdened healthcare system and frequent displacement will complicate disease monitoring and a comprehensive, multidose vaccination campaign. One option for vaccine delivery is through healthcare facilities. By 23 July, however, only 16 (45%) of Gaza's 36 hospitals and 45 (45%) of its 105 primary healthcare facilities were partially functional (WHO 23/07/2024). This includes three partially operational hospitals and one fully operational field hospital in Deir al-Balah, and three partially operational hospitals and two fully operational field hospitals in Khan Younis (WHO 27/07/2024). The remaining functional health facilities are already struggling to treat influxes of patients

with severe trauma, injuries, and burns, pregnant women and newborns, and people affected by hepatitis A, diarrhoeal diseases, respiratory diseases, and other infections circulating in Gaza (MSF 29/07/2024; UNRWA 30/07/2024). It is difficult to envision how healthcare facilities will administer a complex and comprehensive vaccination campaign in these conditions.

Further, there is limited public information on the functionality of laboratories and the availability of supplies to test for polio in Gaza (NBC 23/07/2024). Israeli operations in July in Ash Shuja'iyeh neighbourhood, eastern Gaza city, destroyed Sabha Al Harazeen medical clinic. According to Gaza's Ministry of Health, the clinic contained the only laboratory in Gaza performing public health tests of water, beverages, food, and pharmaceuticals in order to prevent and control disease outbreaks (OCHA 12/07/2024). Health ministers from countries in the region have discussed a regional outbreak response and prevention plan, including technical and laboratory support for testing samples from Gaza to monitor polio spread (WHO 26/07/2024).

Frequent displacement will further complicate both disease surveillance and a vaccination campaign aiming to reach people in IDP sites and homes. Up until 30 July, Israeli evacuation orders and declared 'no-go zones' had forced the estimated 1.9 million IDPs in Gaza to constantly relocate (UNRWA 24/07/2024; STC 30/07/2024). This includes 200,000 people displaced following evacuation orders between 22–27 July alone (CARE 30/07/2024). Repeated displacement will render it nearly impossible to ensure that IDPs have access to all three OPV doses.

FIGURE 1. HEALTHCARE FACILITY FUNCTIONALITY IN GAZA, 22 JULY 2024



Source: WHO (27/07/2024)