Vaccine-derived polio in Peru after 32 years of elimination: reflections on the routine childhood immunisation coverages

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After 32 years of polio elimination in Peru, six sporadic cases of vaccine-derived poliovirus (VDPV) have been reported between 2003 and 2011 in urban and peri-urban settings. On 21 March 2023, a new case was confirmed in a one-year-old indigenous male infant resident of the district of Manseriche, Loreto region, located in a remote area in the north-eastern Peruvian jungle (Fig. 1a). The patient developed fever, cough, and weakness in the lower limbs, and had not received any previous vaccinations. Therefore, a sample was taken and sent to the Oswaldo Cruz Institute (FIOCRUZ) from Brazil, given the absence of PCR and genomic tests for polio in Peru. A type 1 VDPV was detected.[1]

Beyond the public concern, the response to this case was comprehensive, encompassing a wide range of epidemiological measures. Firstly, immediate case notification within 24 h was ensured, following a standardized flowchart. Additionally, epidemiological investigation activities were promptly initiated within 48 h of case notification. Secondly, active community and institutional searches were conducted, and stool samples were collected when needed. Thirdly, a rapid block vaccination strategy was implemented for all children under five years of age within 48 h of case recognition. Fourthly, verification of vaccination schedules was undertaken, with particular emphasis on children aged 6 months. Fifthly, the indications and contraindications for vaccination were reinforced. Sixthly, a comparative analysis was performed between previous administrative coverage and rapid coverage monitoring reports, in conjunction with rapid cross-community coverage monitoring. Finally, community vaccination campaigns were executed in areas deemed at risk (areas with low vaccination coverage).[1]

Peru is a middle-income country with a fragmented, segmented, and inequitable health system,[2] whose child immunisation coverage is subjected to wide socioeconomic and spatial inequalities,[3] despite being administered free of charge.[4] Throughout this millennium, the national immunisation schedule has undergone variations with the inclusion of new vaccines, many of which were based on an informed decision-making system.[5] In 2022, it was modified, reducing the number of doses of oral polio vaccine (OPV) to one at four years of age, and four doses of inactivated poliovirus vaccine (IPV) administered at two, four, six, and 18 months of age. Before that, two doses of IPV (at two and four months) and three doses of OPV (at six and 18 months, and four years) were routinely co-administered with other antigens. Additionally, in this last amendment, hepatitis A vaccine was introduced in the infant schedule for both sexes and the use of HPV vaccine was extended to boys within the school schedule. These inclusions were made following recommendations by the Advisory Committee on Immunizations based on independent assessments; although, the new schedule, would progressively come into effect throughout 2023 and 2024.[4]

Unfortunately, the COVID-19 pandemic disrupted the administration of vaccines in Peru and other Latin American countries, thereby substantially reducing vaccination coverage, mainly among children under one year.[3,6] Complete OPV coverage among children in 2022 was 43.6% in Manseriche, 73.6% in Loreto, and 81.4% in Peru.[1] (Fig. 1b).

The administration of OPV, which is genetically unstable, has led to numerous case outbreaks in recent years globally, accounting for 1818 cases from 2016 to 2021, exhibiting an upward trend.[7] In Latin America, the uninterrupted use of OPV, the low vaccination coverages, and the presence of susceptible populations have led to several cases of VDPD during the last years.[8] OPV has been primarily used due to its reduced cost and ease of administration–compared with IPV–but it is still

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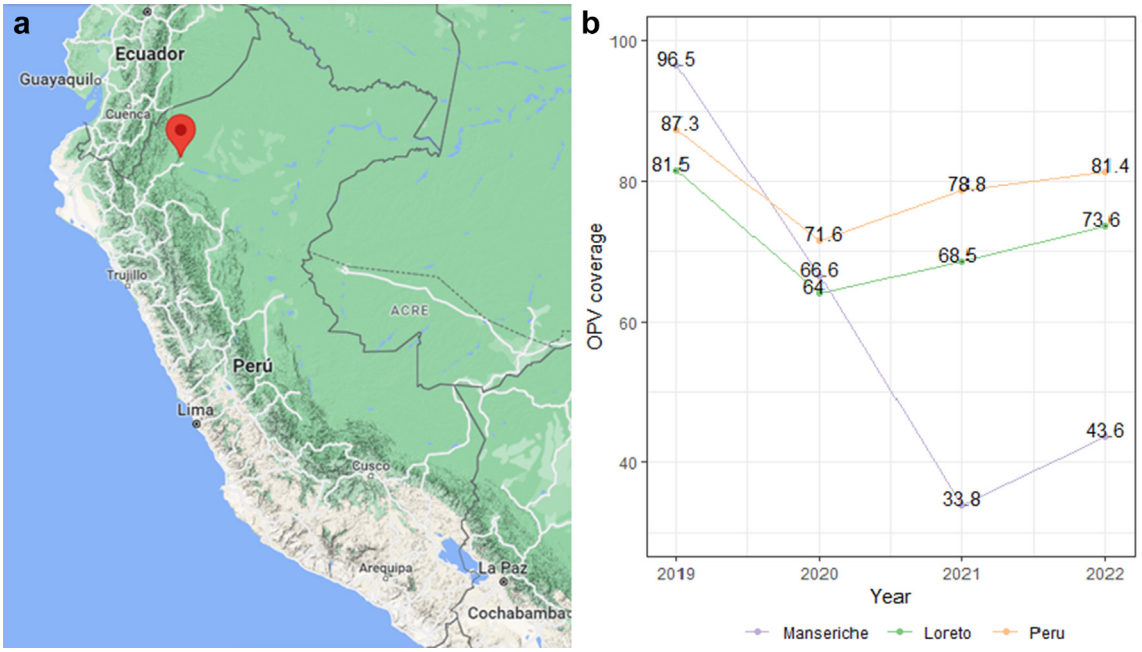


Fig. 1: Vaccine-derived polio case in Peru **a.** Localization of the case in Alto Marañón sector, Manseriche district, Datem del Marañón province, Loreto department, Peru. **b.** Oral polio vaccine coverage from 2019 to 2022. **Note**: a was constructed in ArcGIS Online (ESRI, Redlands, CA, USA). b is based on data from CDC-Perú https://www.inr.gob.pe/transparencia/Epidemiología/alertas%20epidemiologicas/2023/AE006_2023.pdf.[1]

important in endemic countries to stop person-to-person transmission.[9,10] Nevertheless, with the reduction of polio due to wild-type poliovirus, IPV would outweigh OPV.[10] Currently, most countries in this region administer at least one dose of OPV.[9] Regarding IPV administration, vaccination coverages in Latin America are too low and heterogeneous, and does not allow achieving vaccine efficacy.[11] Consequently, Latin American countries should develop optimal strategies to maintain and improve vaccination coverage, reduce sectors with low coverage and implement a nominal vaccine registry.[12] Given these events, it is time for Peru, a non-endemic country, to recover adequate vaccine coverages and withdraw OPV soon.

The fight against polio continues and no country is free from re-emerging outbreaks. Peru is a country where vaccine-preventable diseases must be tackled to avoid the enormous burden they place on the health system. Difficult geographical access and vaccine hesitancy threaten polio control. Hence, it is of paramount importance to strengthen local measures to improve vaccine confidence, especially in vulnerable indigenous populations. Once polio vaccination coverage returns to optimal levels, the childhood vaccination schedule should be reconsidered.

Contributors

Ali Al-kassab-Córdova: Conceptualisation, investigation, visualisation, and writing-original draft.

Omar Napanga-Saldaña: Investigation, writing-original draft, and validation.

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Not applicable.

Declaration of interests

The authors declare no conflicts of interests.

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