VILLAGE REACH®

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From Ambition to Implementation

The Use of Outsourced Transport to Deliver Polio Lab Samples

Polio lab sample delivery in Lualaba, DRC.

Photo Credit: VillageReach

In 2022, VillageReach and its partners launched the Polio Lab Sample Transport (PLST) program to improve the speed and quality of polio sample delivery. The program assessed the transportation of polio samples in 15 African countries. This technical note highlights the challenges identified during the assessments and offers lessons learned from using private transport to move lab samples.

Background

Polio is a highly infectious viral disease that affects children under 5 years old. The virus enters the body through the mouth and multiplies in the intestine, eventually invading the nervous system, sometimes causing irreversible paralysis. While there is no cure for polio, there are safe and effective vaccines.

In Africa, immense progress has been made in polio eradication over the past decades, with the region declared free of indigenous wild polio by the Africa Regional Certification Commission in August 2020. The virus resurfaced, however, in February 2022 with new cases identified in Malawi and Mozambique. While affected countries responded and contained the spread of wild polio swiftly, by increasing surveillance and ramping up lab testing and immunization activities, delays in reporting new cases, e.g., the time it takes to collect, transport, test and report on polio samples, continue to be a challenge for many outbreak-prone diseases.

In January 2022, the Global Polio Eradication Initiative set a global target of three days for samples to reach the lab, regardless of where the lab is located. However, this target was adjusted to seven days in 2025 for countries that do not have polio testing labs in the country. (Polio can typically only be analyzed at a central laboratory in the national capital, or at a reference laboratory outside the country). Many delays in lab sample transport occur in-country between the point of collection (the patient) at the community/health facility level and the national testing sites/transit points. Reasons for delays include geographic barriers, areas of insecurity, limited resources and personnel, bureaucratic delays/extra stops, lack of available transport, limited data availability and lack of incentives (fast reimbursement).

POLIO LAB SAMPLE TRANSPORT PROGRAM

Since faster diagnosis is needed to prevent transmission as well as to eradicate poliovirus worldwide, ensuring reliable and efficient transportation of polio samples is a critical need. To address this, VillageReach and partners launched the Polio Lab Sample Transport (PLST) program to improve the speed and quality of polio sample delivery, under the umbrella of the Global Polio Eradication Initiative. The program started with national assessments in 15 African countries[1] in 2022. These assessments identified polio sample transport bottlenecks and other challenges that hinder quick diagnosis, leading to slower results and a delayed response to potential outbreaks.

GS4 polio sample couriers, Malawi. Photo Credit: GS4

Following these assessments, VillageReach worked with ministries of health, the World Health Organization (WHO) and other local partners to co-create implementation plans, which were tailored to address country-specific transport challenges. These programs aimed to improve the timeliness and quality of polio sample transportation from patients and environmental surveillance sites to national and international labs, to detect poliovirus faster and stop transmission.

Country-specific solutions included:

- **Transport network redesign** to eliminate unnecessary stops, introduce on-demand transportation and/or increase the frequency of sample pickups (if immediate, on-demand transport was not possible).
- **Selection and contracting** of local private transporters, where available, even at the last mile.
- **Deployment of electronic sample tracking systems** to track geolocation and temperature in real-time, in areas with significant transport delays.
- **Standard operating procedures (SOPs)** on sample packaging, transport, cold chain, biosafety and reporting.
- **Integration** of **polio sample transport** with other disease samples for sustainability and cost efficiency.

Initial implementation occurred in 15 African countries, with the successful elements transitioned to government ownership in nine of them (Cameroon, Ethiopia, Kenya, Malawi, Tanzania, Nigeria, South Sudan, Uganda and Zambia) by early 2024, followed by two more countries by early 2025 (Mozambique and Chad). Implementation activities are ongoing in the remaining four countries: Democratic Republic of Congo (DRC), Niger, Guinea and Angola.

Leveraging Outsourced Transport for Lab Samples

Governments in low- and middle-income countries have limited resources to operate their public health systems. However, the local private sector has experienced tremendous growth in Africa in recent decades. It can offer governments financial resources, specialized skills, physical assets and the technology necessary to support public

[1] Democratic Republic of Congo, Guinea, Niger, Chad, Mozambique, Malawi, Nigeria, Tanzania, Kenya, Ethiopia, Cameroon, Zambia, Uganda, South Sudan and Angola

health systems. The use of private sector transport in Africa has proven effective in increasing the availability of health products, especially for underreached communities.[2,3,4]

Figure 1: PLST Countries with and without private transport

The national assessments identified specific challenges that outsourced transport could address. For example, governments in Africa do not always have the resources to transport samples from health facilities/communities to the provincial or national level. This left health workers to manage the long journey from sample collection to the district, provincial or national level. Additionally, for some governments, it is a challenge to invest in a well-maintained and varied transport fleet, especially in areas that are geographically hard-to-reach in terms of both terrain and road infrastructure. In addition, the rainy season can flood roads, making it difficult for many vehicle types. This meant reaching communities required boats, which governments did not always have available. Integrating local private transporters and leveraging their transport expertise can bypass the complexities and high costs of maintaining government-owned transportation fleets (i.e., fuel, vehicle cost and maintenance, drivers).

Due to these challenges, 10 out of the 15 PLST implementation countries (Figure 1) opted to use private transporters to move polio lab samples during all or part of the journey between collection and the national level. From there, samples were either tested in national labs or flown (with support from WHO) to international testing sites. Even for the ten countries that used private transport after 2022, health workers still did some of the transport at the local level - especially in areas where private transporters did not exist or were unwilling to engage in this type of work or in conflict areas where travel was less safe.

VillageReach's Outsourced Transport Resource Center (OTRC) provided technical assistance to countries that engaged private transporters by developing contracts and SOPs between private transporters and VillageReach, in-country partners or local health departments/health facilities. OTRC assisted countries in either introducing, scaling or leveraging existing private transport systems. Each country customized how it used private transport to meet its

[2] Tetteh EK. Outsourcing Supply Logistics for Health Commodities in Africa. J Health Care Poor Underserved. 2024;35(3):995-1010. PMID: 3912961

[3] Agrawal P, Barton I, Bianco RD, Hovig D, Sarley D, Yadav P. Moving Medicine, Moving Minds: Helping Developing Countries Overcome Barriers to Outsourcing Health Commodity Distribution to Boost Supply Chain Performance and Strengthen Health Systems. Glob Health Sci Pract. 2016 Sep 29;4(3):359-65. doi: 10.9745/GHSP-D-16-00130. PMID: 27688714; PMCID: PMC5042692.

[4] Solomon, Habtamu & Tamrie, Manaye & Abebe, Abinet & Haile, Kaleab & Tufa, Biniam & Ambaye, Abyou. (2023). Outsourcing a Means for Strengthening the Health Care Supply Chain Management: A Narrative Review. 10.35248/2329-6488.22.1

needs. For example, some countries used private transport country-wide, while in other countries private transport was used as a backup or complementary system. Overall, the use of private sector transport was one of the most impactful interventions of the PLST program, leading to faster polio sample delivery at the labs.

Lessons Learned

Leveraging private sector transport can be successful if it aligns with a country's needs and context. While it is not the solution for every country, we learned valuable lessons that others can apply to routine and on-demand transport of lab samples and other emergency health products.

REFOCUSING THE ROLE OF HEALTH WORKERS

By shifting transport responsibilities to specialized transporters, health workers could refocus on patient care and quality service delivery. For the countries that used private transport, transporters would pick up the samples at the health facilities (most often on demand) or transport was divided into segments, whereby health workers only had to cover local routes, with transporters responsible for the rest of the trip up to the national and international level. This allowed health workers (and surveillance officers) to keep their focus primarily on sample collection from patients and triple-packaging the samples for transport. Both health workers and private transporters received training on biosafety, cold chain maintenance, reporting of data and other aspects of sample handling and transport.

This learning reframes outsourcing as more than a logistical fix; it is also a human resource strategy, protecting scarce clinical capacity and leveraging the health workforce where it matters most. In this way, private-sector engagement directly strengthens the resilience of frontline health systems by focusing the role of the health worker on patient care.

DESIGNING SMARTER SYSTEMS

Many African countries face geographic and infrastructure challenges that can disrupt their health supply chains and lab sample transportation systems. These physical challenges are exacerbated by systemic limitations of government-owned transport fleets, especially in remote and hard-to-reach areas. In leveraging private transport providers, the PLST program made the case that the innovation needed to increase access to health products and lab services is less about adding more vehicles to a fleet, and more about designing smarter systems. Outsourced logistical solutions do more than circumvent physical barriers; they reframe them as surmountable and, as a result, enable nimbler, efficient and technology-enabled supply chains. By using private providers, the government shifts from "how do we build and maintain a vehicle for every type of terrain?" to "how do we design a transporter network that can flexibly connect even the hardest-to-reach communities into the health system?" This shift in perspective, in turn, transforms geographic isolation from a barrier to an opportunity where resilience, integration and equitable access are the main drivers of public health supply chains.

Polio lab sample transport in Guinea. Photo Credit: FHI360

Beyond its impact on decreasing lab sample transport time, outsourced transport also provides an opportunity for system-wide learning and change. Experience has shown that achieving success requires a greater focus on actions than merely moving samples faster. This means looking at things such as aligning incentives, bureaucratic bottlenecks and other structural issues so that laboratory logistics is embedded in larger, more productive and fully functional health systems.

ENSURING QUALITY TRANSPORT

Having accurate data is critical to assessing transportation performance. Health workers, district and provincial surveillance officers and national health supervisors often do not have the capacity to monitor transport data, such as duration (by trip segment), volume, number of trips and temperature. As part of their contracts and payment process under this project, private transporters are required to record and report this data, and in some areas were entrusted with sample tracking devices, making it easier for countries to discover bottlenecks and develop continuous improvement plans.

For example, in Malawi and DRC, contracts with private transporters were performance-based; that is, if samples were transported within a specific timeframe, the transporter would receive 100% of the payment. If this prerequisite was not met, for instance, transporters would receive 50% of the payment. This approach was intended to create efficiencies and institutionalize a performance/results-based culture. This type of incentive program can also change a government's relationship with its private providers, as payment is about "paying for health impact," and sets the foundation for sustaining efficient and mutually beneficial partnerships.

GS4 couriers move samples on demand in Malawi. Photo Credit: GS4

Finding the right payment structure is important to ensure private transporters are not overpaid for moving individual samples on an emergency (on demand) basis, but are still motivated to do these low-volume transport runs. In some countries, transporters are paid by distance, in other countries they have performance-based contracts that incentivize urgent deliveries, and in other countries, the postal service is involved and provides volume-based discounts (the more samples are moved to the national capital, the lower the cost per sample).

Conclusion

The single most valuable lesson from outsourcing has been the potential to use cross-disease integration, where transporter networks that carry polio samples also support improved surveillance and response for other priority diseases, thereby increasing the sustainability of every transport dollar. When samples are only transported on demand for a single disease, at low volumes, governments and private transporters struggle to sustainably afford ongoing transport. Combining on-demand transport with existing routine pickups can save time and money for governments and partners, as well as enhance sustainability and cost-efficiency. Outsourced transport offers long-term value for not only lab samples, but also other health products (medicines, vaccines and medical supplies).

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