

Drones for Health: Speeding up Laboratory Sample Transport from Hard-to-Reach Communities in Malawi, Mozambique and DR Congo

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Photo Credit: Swoop Aero, Malawi

BACKGROUND

When patient samples cannot be rapidly transported to a laboratory for testing, the health of entire communities is at stake. To speed up treatment initiation and outbreak control, VillageReach has partnered with governments and the private sector to evaluate and scale up integrated bi-directional drone transport systems.



INS, Mozambique. Photo by Cine Group

METHODOLOGY

Long-term evaluations of the effectiveness of lab sample transport by drone are scarce. Ministries of Health in Malawi, Mozambique and DRC have been using Swoop Aero's drones for routine, on-demand and emergency deliveries of lab samples, rapid diagnostic tests, lab supplies & test results for 1-3 years.

Drones fly for 50-100 km at speeds of 100+ km per hour, land at remote facilities where health workers receive them, and return at the push of a button. Carrying capacity is 3 kg. They complement other means of transport for routine disease surveillance and during epidemics and natural disasters.

VillageReach has completed process & outcome evaluations in all 3 countries between 2020-2023. A Randomized Control Trial is ongoing in Malawi, with baseline data collected in early 2023.



Photo credit: Swoop Aero, DRC



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Summary

Drones have transported more than 10,000 lab samples from 115+ rural health facilities across all 3 countries.

- In Malawi, reductions in turnaround time (TAT) were reported by the 39 health facilities that utilized drones the longest (for 2+ years) with high satisfaction rates among health workers and community members (VillageReach & INSEAD, 2023).
- In Mozambique, TAT for HIV viral load, EID and TB-GeneXpert decreased by 42%, 14% and 43% respectively, and sample quality was not compromised (VillageReach & INS, 2022).
- In DRC, acute flaccid paralysis (AFP) samples received within 2 days at the provincial level increased from 35% to 69% once drones were introduced in combination with ground and boat transport (VillageReach & KSPH, 2022).

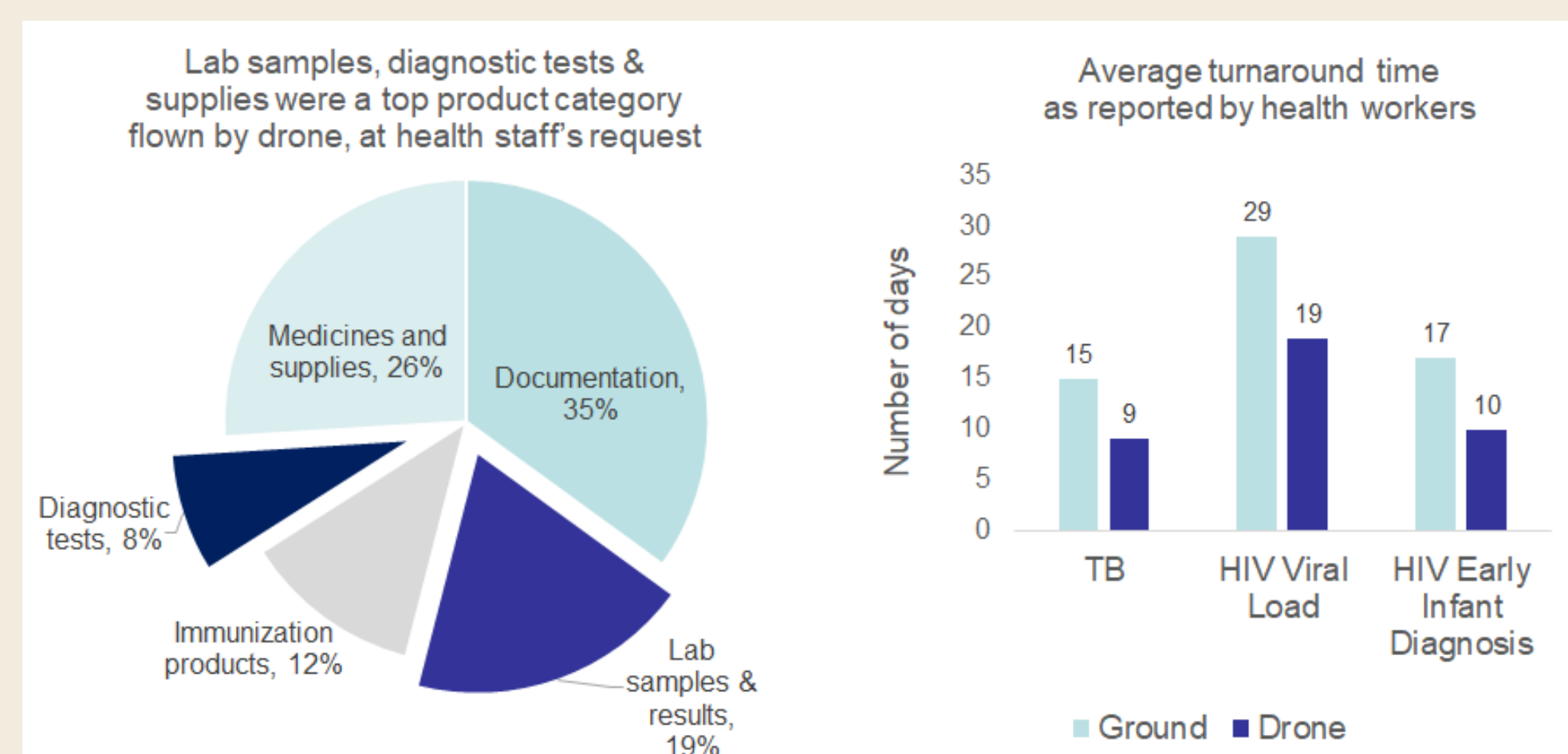
RESULTS

Malawi

Phase 2 (2.5 years)
Southern region

70+ health facilities
7 district labs

On-demand drone flights
of any medical products



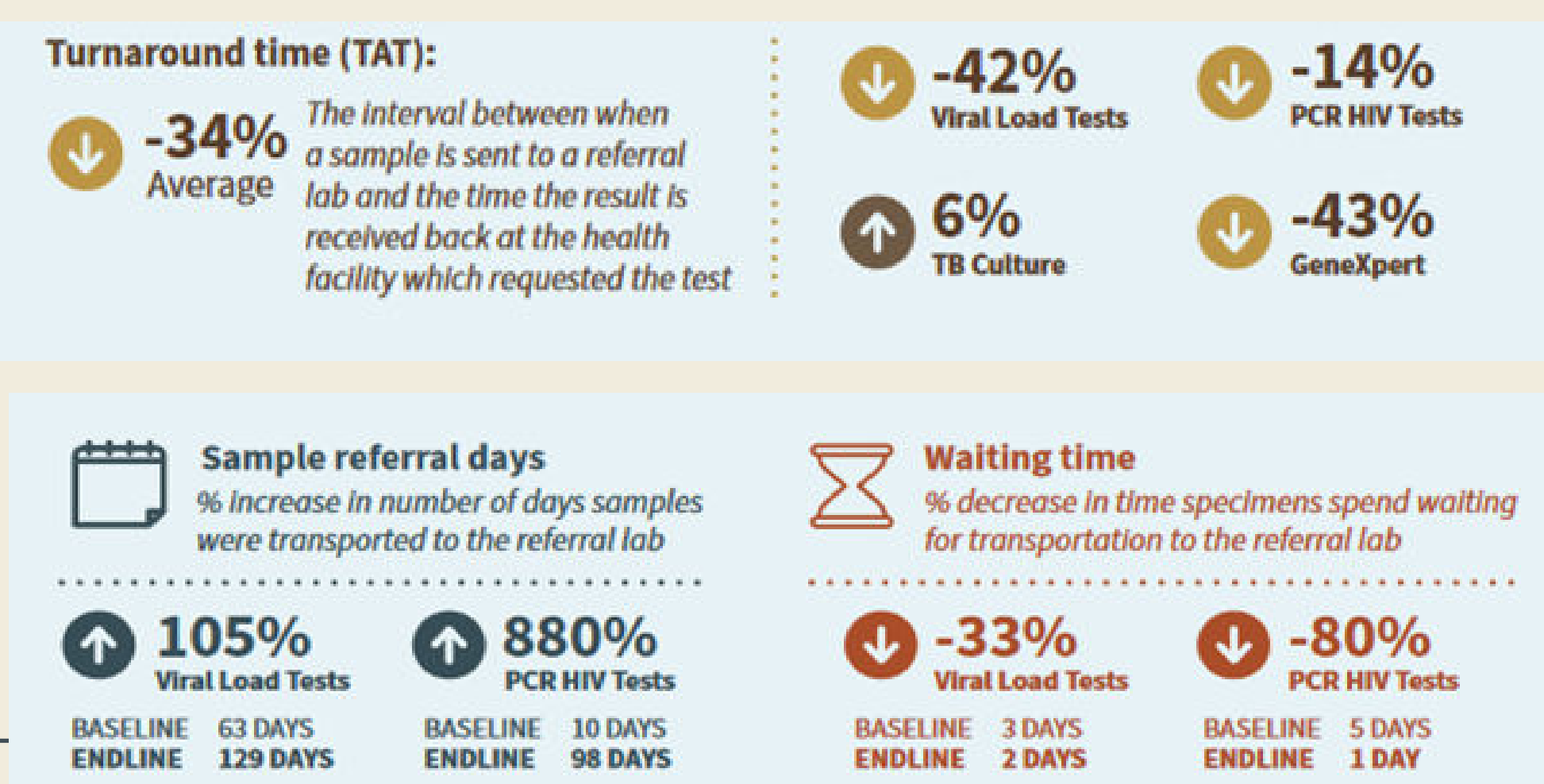
For more info, visit: <https://www.villagereach.org/project/drones-for-health-in-malawi/>

Mozambique

Phase 2 (1 year)
Inhambane province

6 health facilities
1 district lab

Daily sample pick-ups



For more info, visit: <https://www.villagereach.org/project/drones-for-health-in-mozambique/>

DR Congo

Phase 2 (2.5 years)
Equateur province

40 health facilities
1 provincial lab

Samples picked up when
vaccines dropped off

KEY INDICATORS	Baseline	Endline	Trend
Hard-to-reach health facilities (drone landing sites)	Apr - Sep 2020	Jan - Jun 2022	
Vaccine availability (last 3 months)	65%	98%	↑
% facilities with stockouts (last 3 months)	6%	0%	↓
• Pentavalent vaccine	12%	4%	↓
• Measles vaccine	18%	0%	↓
• Yellow fever vaccine			
% facilities taking 2+ days to get vaccines	65%	0%	↓
% facilities stocked according to plan	32%	98%	↑
% AFP samples received at provincial EPI within 2 days (Drones + ground/boat transport)	35%	69%	↑

For more info, visit: <https://www.villagereach.org/project/drones-for-health-in-the-drc/>

OUTPUTS



5,673 flight hours
6,541 product deliveries
586,265 km flown



4,413 kg medical products
10,849 lab samples
448,225 vaccine doses



320,172 people directly benefited from products delivered by drones

CONCLUSIONS

- Strengthening laboratory systems is a priority that can be met by using drone transport for faster disease diagnosis, and consequently faster initiation of treatment and containment of infectious diseases.
- Drones can address transportation infrastructure gaps in hard-to-reach areas globally.

