Polio Lab Sample Transport

GPEI Meeting - 30 May 2024

Integrated MoH lab sample transport hubs in Uganda. Photo: Denis Onyodi for VillageReach

Polio Lab Sample Transport

Following national assessments in 2022, VillageReach and partners have been implementing customized programs in **15 countries** at risk for **polio outbreaks**, aiming to improve the **speed & quality** of AFP & ES sample transportation from communities/health facilities to national/int'l laboratories.

Objectives	Sub-objectives
ACHIEVE COORDINATED & EFFECTIVE SAMPLE TRANSPORT SYSTEMS	• **Timeliness** & reliability of transport • Sample quality (**condition, temperature**) • Governance (coordination, integration) • Efficient response to outbreaks • Sustainable transport systems
IMPROVE SAMPLE TRACKING, DATA VISIBILITY & QUALITY	• Enhanced, real-time **sample tracking** • Improved **data visibility** & proactive monitoring for Ministries of Health

Visit the **Program website** to read our Country stories & view the film released on World Polio Day

Polio Sample Transport: Outputs

Implementation stage: 12-20 months, varies by country

15 countries

VillageReach + 12 implementing partners

12
countries with new Polio Sample Transport SOPs

15,250+
health staff, local transporters, community focal points trained

1,400+
contracts with private transporters in 8 countries

11,300+

people whose samples were transported

3,300+

GPS + temp monitoring devices in 11 countries

23
Freezers procured

912
Sample carriers

1,000
Sample collection kits

Progress Towards Objectives:

SOLUTIONS CO-DESIGNED WITH MOH, WHO, STAKEHOLDERS

- **Local private transporters** introduced, in combination with (C)HWs - utilizing all available means of transport to pickup samples, manage trackers, return carriers/ice packs, etc.
- **On-demand, immediate transport** layered on top of routine/scheduled sample pickups in health facilities
- **Transport network redesign**, with level-jumping (more direct routes, eliminating stops, increased frequency of pickups)
- Polio sample **transport SOPs** developed, with health system staff at all levels and transporters **trained** or retrained
- Digital GPS **sample trackers** (to track geolocation in close to real-time, in areas with significant transport delays)
- **Integration** of transport and staff/resources **across diseases** whenever possible (for sustainability and cost efficiencies)
- **Faster reimbursement** (advance payments/mobile money) & equitable sharing of incentives for **(C)HWs** in some countries
- **Performance-based contracts** for transporters have incentivized speed of transport, chain of custody, data sharing

Transport **Timeliness** & Reliability

Countries using **private transporters on large scale**: country-wide or province-wide (all/most samples are moving through our project):

Countries where on-demand **private transport is the back-up/complementary** system (a smaller % of samples countrywide have fallen under project to date):

Countries with project-funded **private transporters – piloted** in specific areas:

20 LGAs (out of 774)

1 region Tabora (out of 31)

Countries where project reimbursed **Health workers/Govt' drivers** for transport:

30 districts (out of 135)

7 provinces (out of 10)

2 regions (out of 10)

12 counties (out of 79)

Countries that didn't require any transport funding from VillageReach:

MoH/WHO already contracted private transporter G4S and met 3-day target

Health staff transport samples efficiently; project focusing on insecure areas

Transportation of lab samples using local transporters, (C)HWs

Photo : Riders for Health, Nigeria

Photo: VillageReach & Davycas, Niger

Photo: CIHEB & Tanzania Post

Photo : Centre for Infectious Disease Research in Zambia

Photo: International Medical Corps, Cameroon

Photo: FHI 360, Guinea Conakry

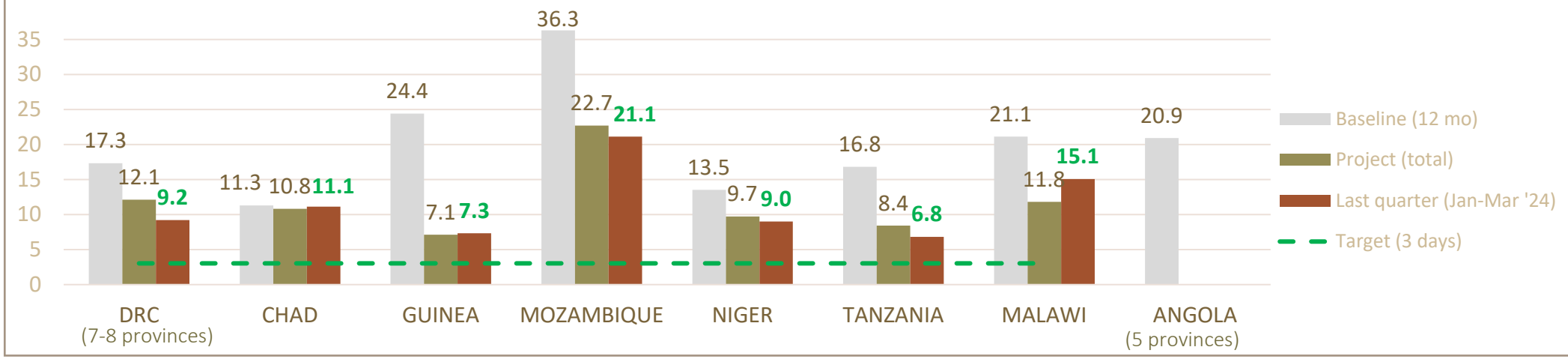
Delivery of cold chain equipment in Ethiopia. Photo: Project HOPE

Photo: G4S, Malawi.

AFP Sample Transport Timeliness Improved

*Countries **not** meeting the 3-day target at baseline (2022) – all send to int'l lab or use air transport*

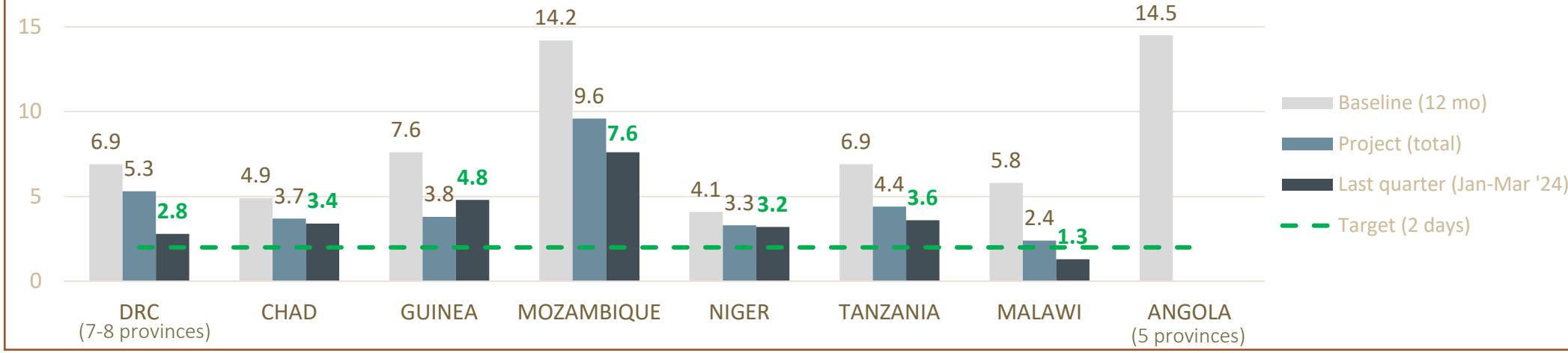
Avg # days from collection to international Lab (exception: national lab in DRC)



Across 7 countries, our intervention contributed to:

- Avg **8.7 day** decrease
- **40%** reduction from baseline to last quarter

Avg # days from collection to national level (exception: to provincial level in DRC)



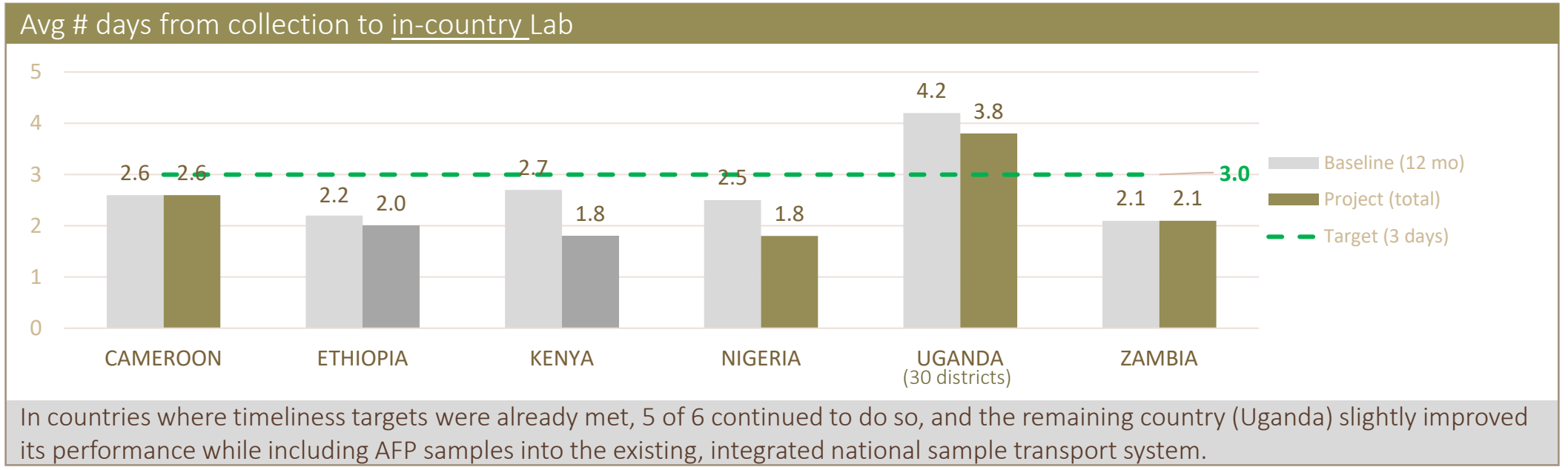
Across 7 countries, our intervention contributed to:

- Avg **3.4 day** decrease
- **46%** from baseline to last quarter

South Sudan also didn't meet the 3-day target at baseline, but national data not available (our project was localized in 12 counties).

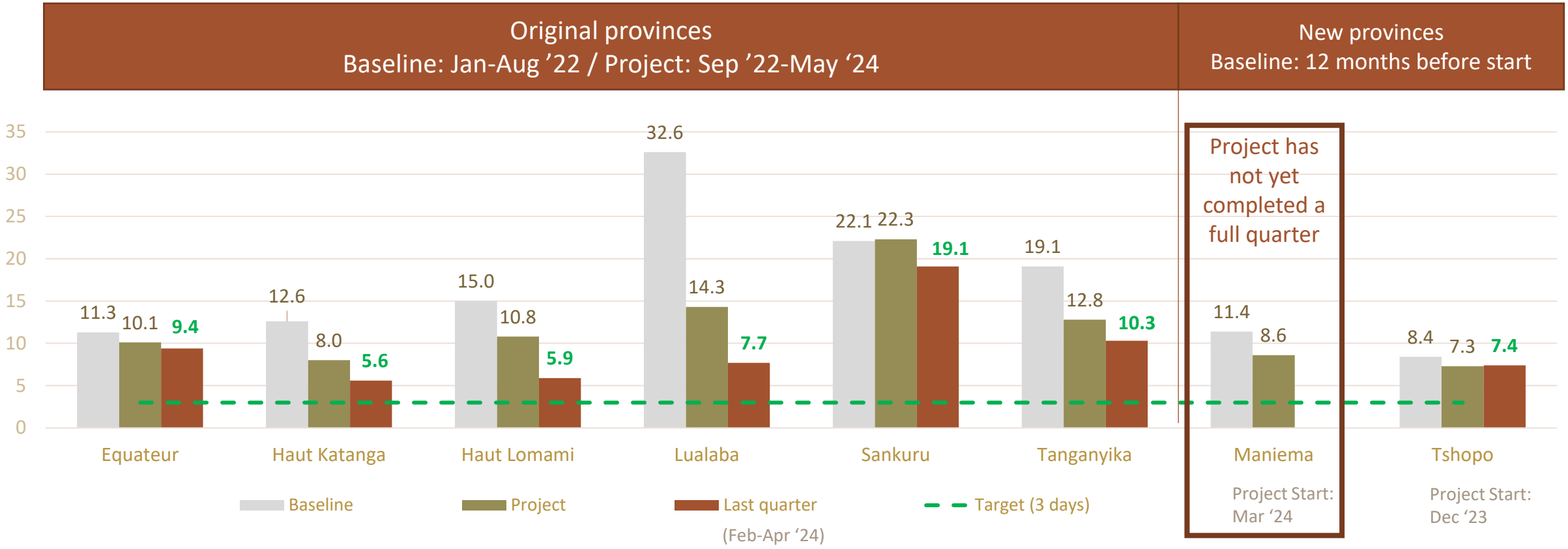
AFP Sample Transport Timeliness Maintained

*Countries **already** meeting the 3-day target at baseline (2022) – all in-country labs*



In countries where timeliness targets were already met, 5 of 6 continued to do so, and the remaining country (Uganda) slightly improved its performance while including AFP samples into the existing, integrated national sample transport system.

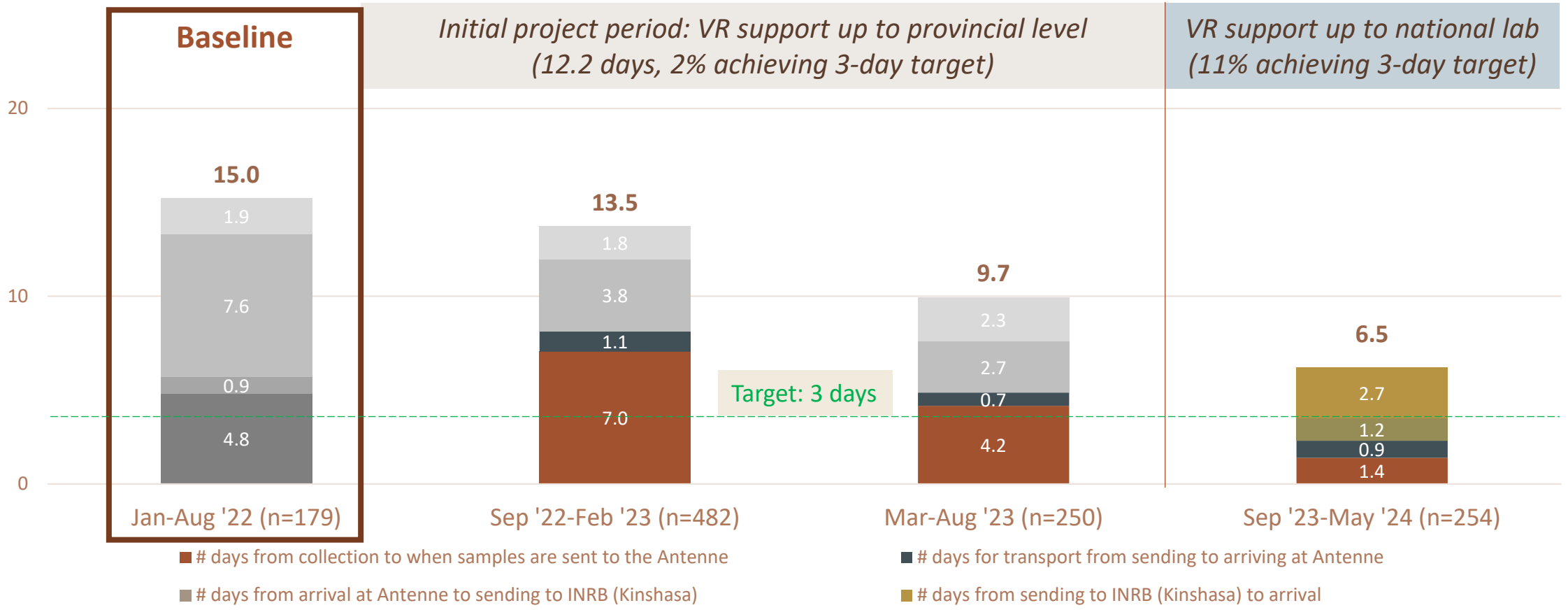
Interventions (route redesign, SOPs, private transporters) led to reductions



Through the national lab, transport time has decreased in all 6 original project provinces, from 17.3 days at baseline to 9.2 days in the last complete quarter (Feb-Apr '24), against a target of 3 days.

- Through the provincial level, transport time has decreased from 6.9 days at baseline to 2.8 days in the last quarter, with 65% of samples now achieving the 2-day project target.

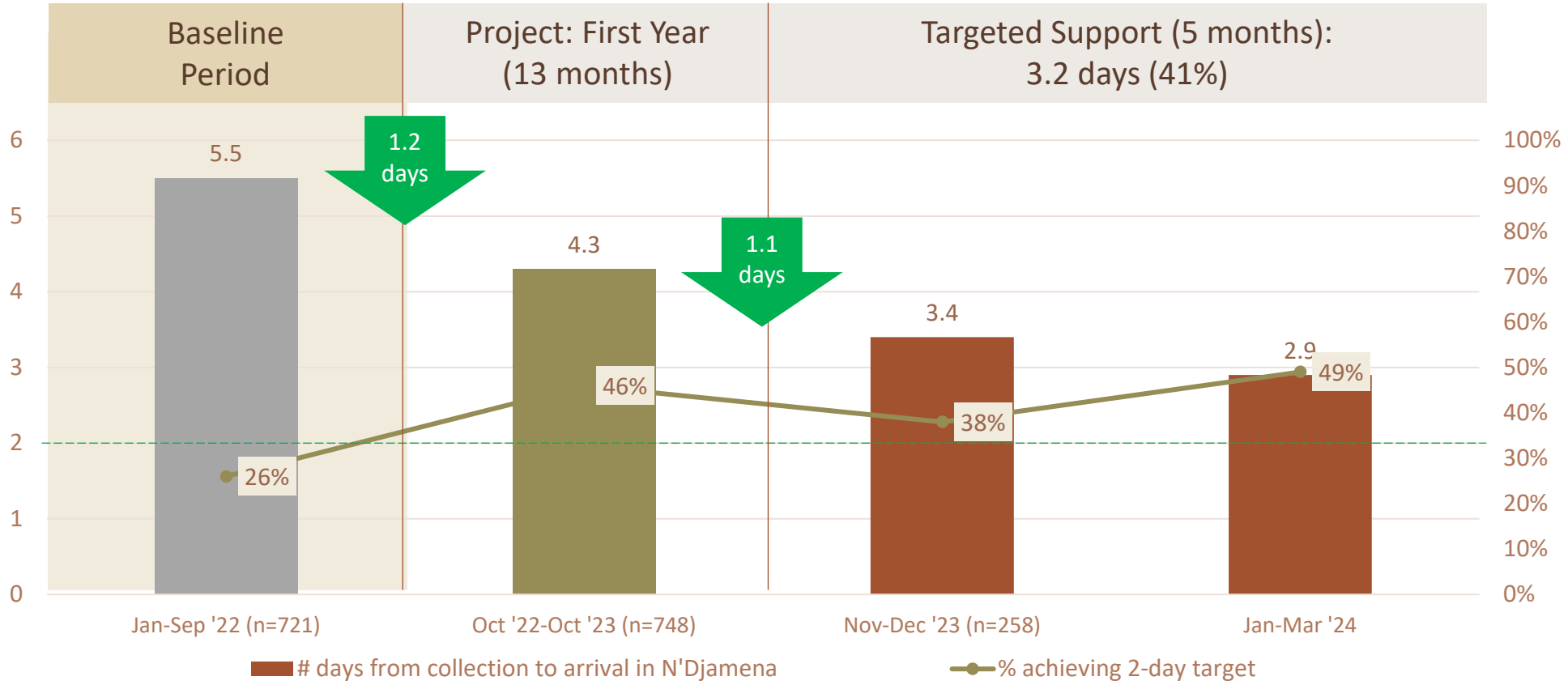
Expansion of transport support to national lab has shown strong results



Since mid-Aug '23, VillageReach now directly supports transport from collection through arrival at the lab. Overall transport time has decreased from 15.0 days at baseline to 6.5 days for Sep '23-May '24, a 57% reduction from baseline.

Resolving contextualized bottlenecks shows promising results

Average # of days from collection to **national capital (N'djamena)**



Extra support in the 7 regions lagging behind:

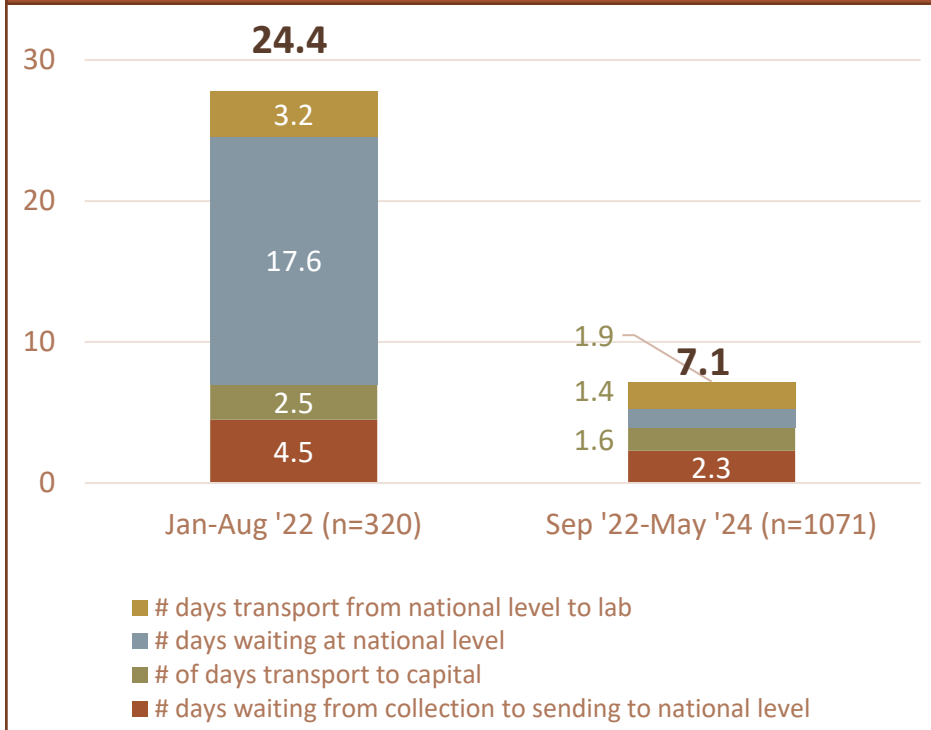
- Hired 2 new polio focal points in each region & provided stipends.
- Shifted to specimen shipping on a rolling basis instead of once a week (1 region).
- Contracting with boat associations in some regions (for rainy season)

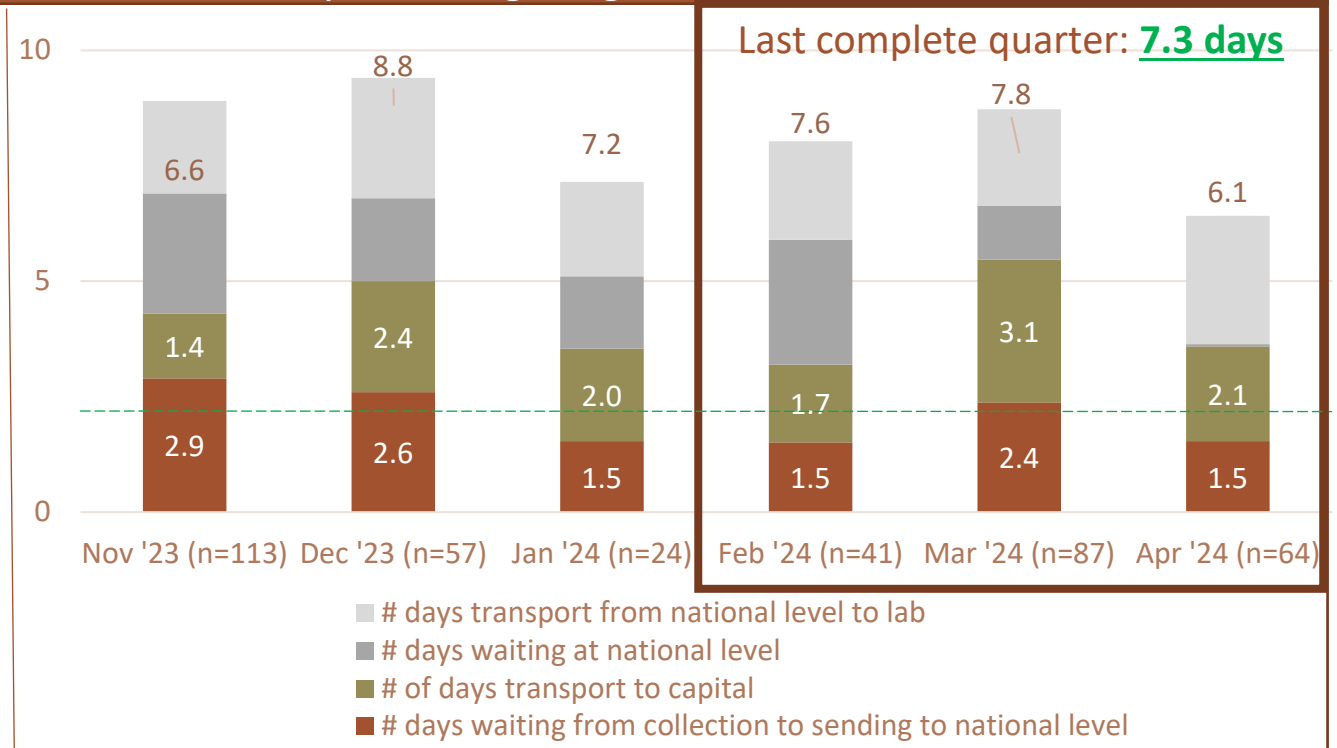
In the project's first 13 months, ASRADD/VillageReach's intervention contributed to a 1.2 day reduction (5.5 days at baseline to 4.3 days). Since Nov '23, ASRADD/VillageReach began providing contextualized support to resolve transport bottlenecks, resulting in a further 1.1 day reduction rapidly (2.9 days in the last quarter, nearly reaching the 2-day target).

7 project regions: Guera, Logone Orientale, Hadjer Lamis, Mayo Kebi Est, Mayo Kebi Ouest, Mandoul, Tandjile

Early significant gains maintained, further reductions possible

Initial impact of addressing bottlenecks at multiple transport segments (national and international level) maintained; new interventions in Apr ’24 targeting 3 days

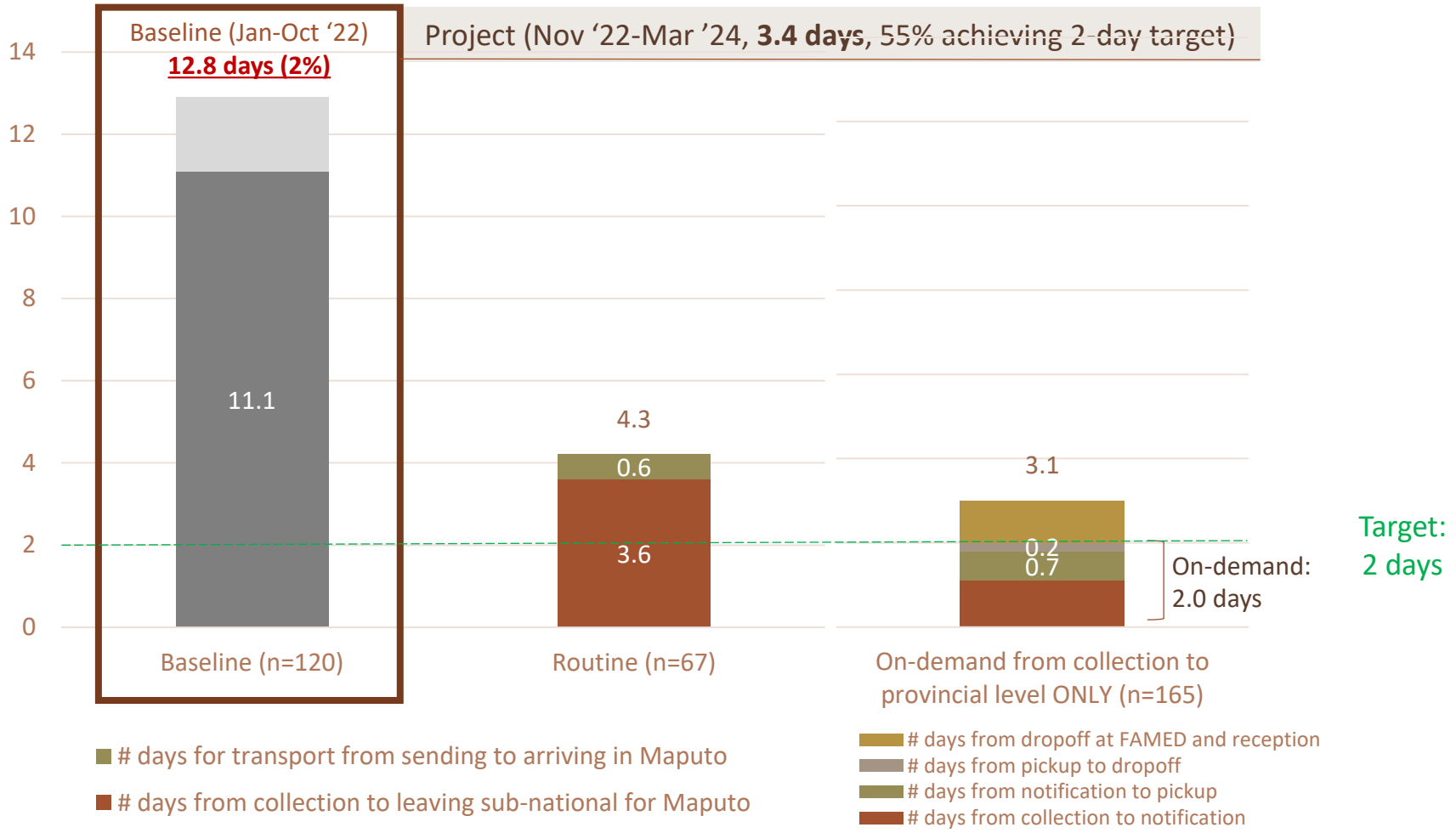




VillageReach recommended **international air travel** to Dakar and helped re-design domestic transport. In-country partner FHI 360 contracted public and private **transporters country-wide**, integrating Polio samples with all other types of samples for transport (leveraging USG funding).
This resulted in a **significant overall reduction** of 17.3 days (24.4 to 7.1 days), a 71% reduction from baseline. Progress has been maintained but further reductions have proved challenging. VR deployed to the country in early April and dedicating consultants at EPI for immediate data entry and verification from both domestic and int’l lab sources and to ensure a faster transfer of samples abroad.

Routine and on-demand transport combined for strong results

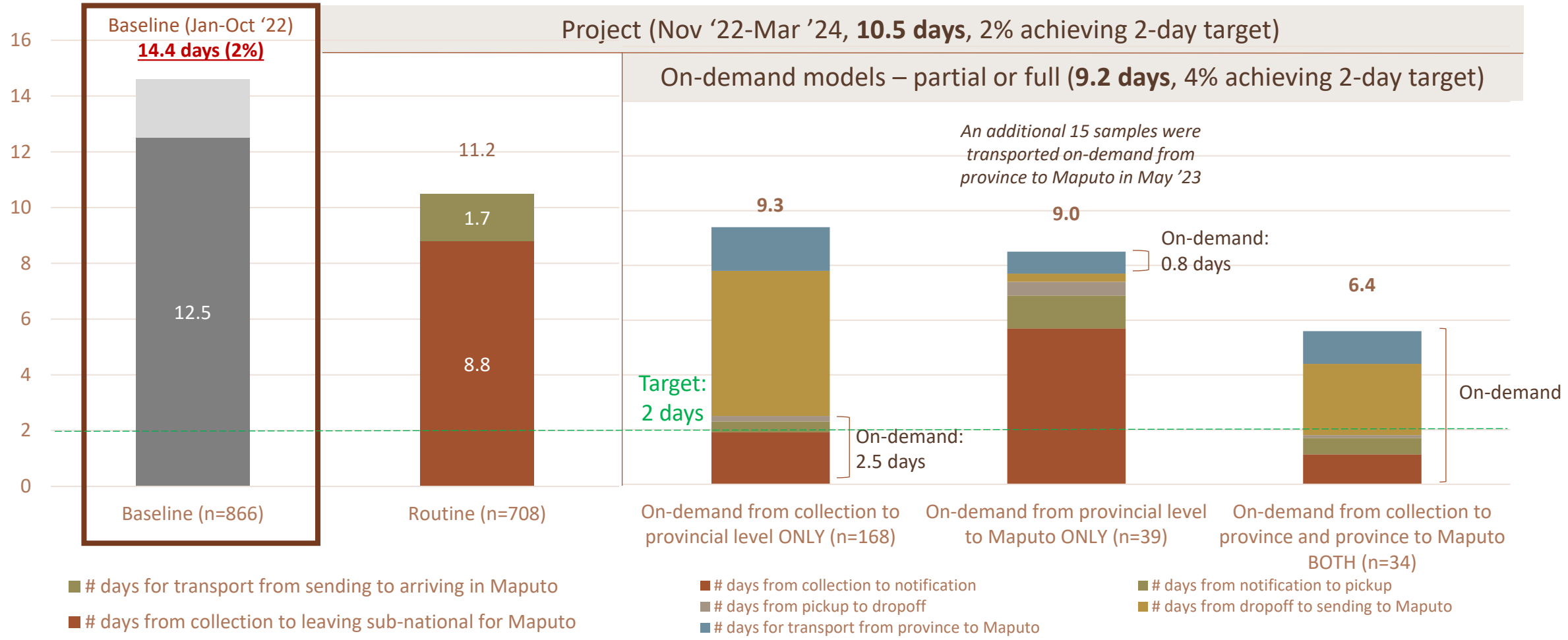
Average # of days from sample collection (community/health facility) to **Faculty of Medicine (Maputo)**



In the Southern provinces, Africa Global Logistics (AGL) - formerly Bollore - transports on-demand from health facilities to FAMED in Maputo. Combined with routine (scheduled) transport, on-demand sample pick-ups in health facilities have successfully reduced transport time from 12.8 days to 4.3 days for routine transport and 3.1 days for on-demand transport, nearly achieving the 2-day target through the national level.

With greater distances, on-demand transport shows promising results

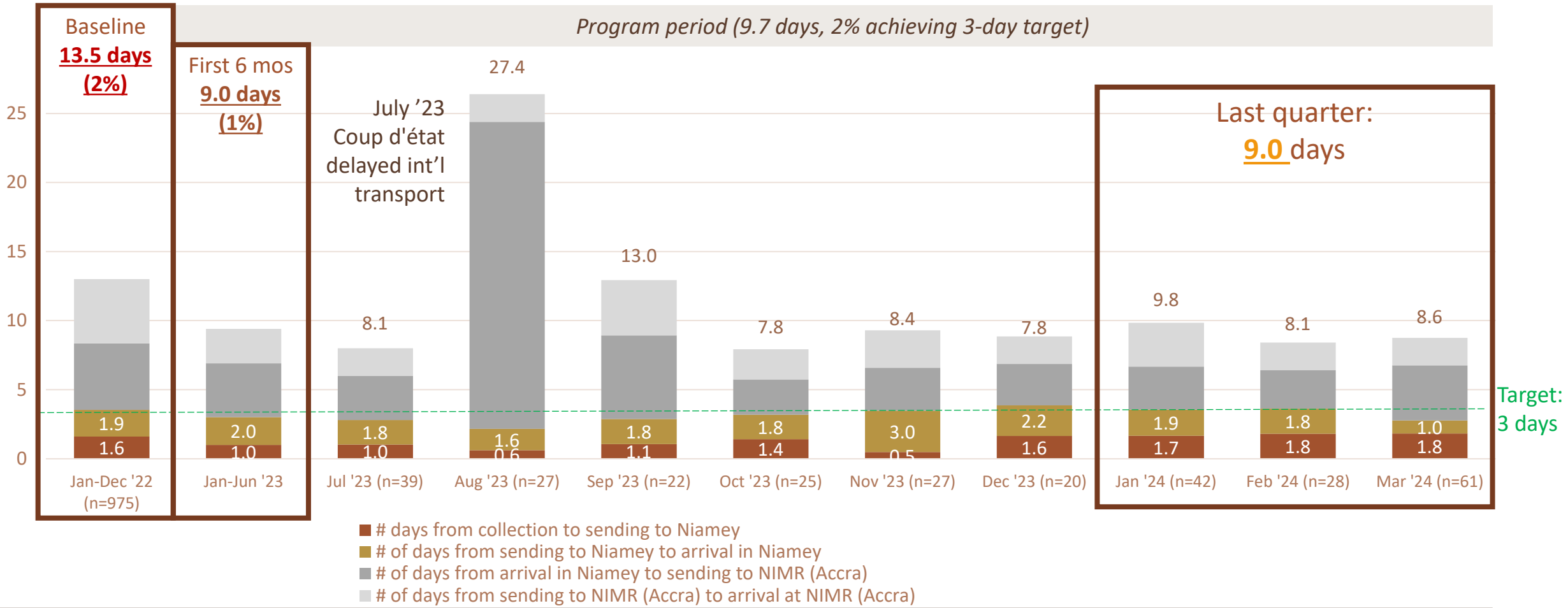
Average # of days from sample collection (community/health facility) to **Faculty of Medicine (Maputo)**



In the North/Central provinces, multiple on-demand models are in place. Combined with routine (scheduled) transport, on-demand has reduced transport time from 14.4 days at baseline to 11.2 days for routine transport and 9.3 for all on-demand models. A limited number of samples have been transported on-demand over the whole transport route, and results are promising (6.3 days). Both routine & on-demand are needed to control costs.

On-demand transport contributes to resiliency

Average # of days from collection (community/health facility) to **int'l lab (NIMR Accra)**

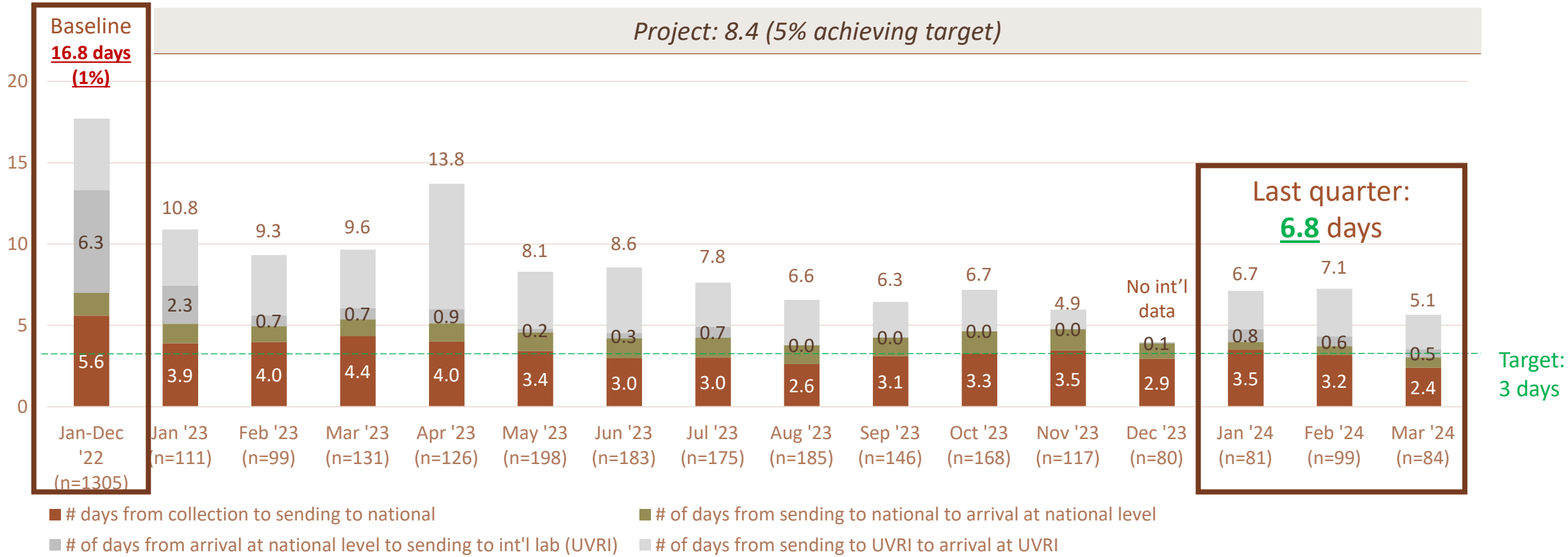


Transport time decreased from 13.5 days at baseline to 9.0 days in the first six months of the project. When a coup d'etat occured, transport time increased, due to int'l borders being closed, but has reduced to 9.0 days in the most recent quarter (Jan-Mar '24).

- ***Up to the national capital, the 2-day target is nearly met.***

Strengthening national sample processing led to quick, sustained reduction

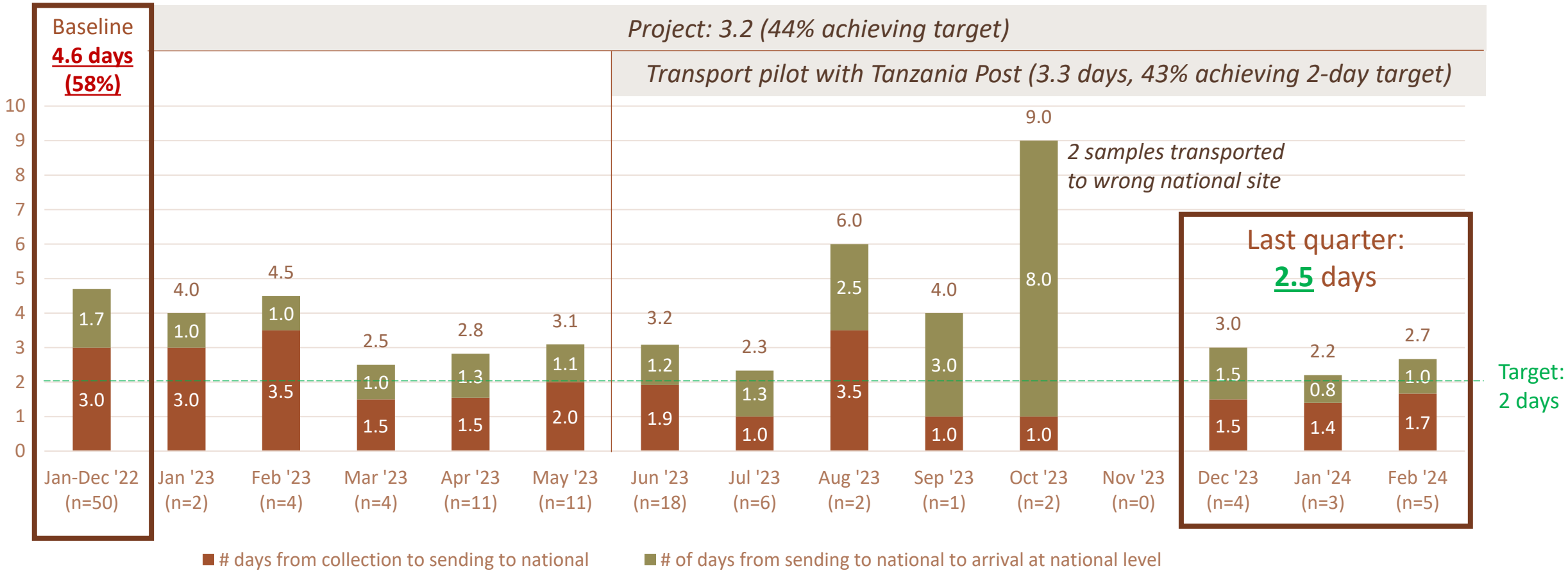
Average # of days from collection (community/health facility) to **int'l lab (UVRI Kampala)**



In Jan 2023 CIHEB added staff at the MoH (IVD) office to facilitate sample processing and packaging. Prior to this, samples waited an average of 6.3 days in Dar es Salaam before being shipped to the UVRI Lab abroad. This initiative resulted in a sharp decrease in wait time, averaging 0.5 days over the remainder of the project, contributing to an overall transport time reduction to UVRI from 16.8 days to 8.4 days for the project period (6.8 days in the last quarter).

With few samples collected, transport pilot had uneven results

Average # of days from collection (community/health facility) to **Dar es Salaam**

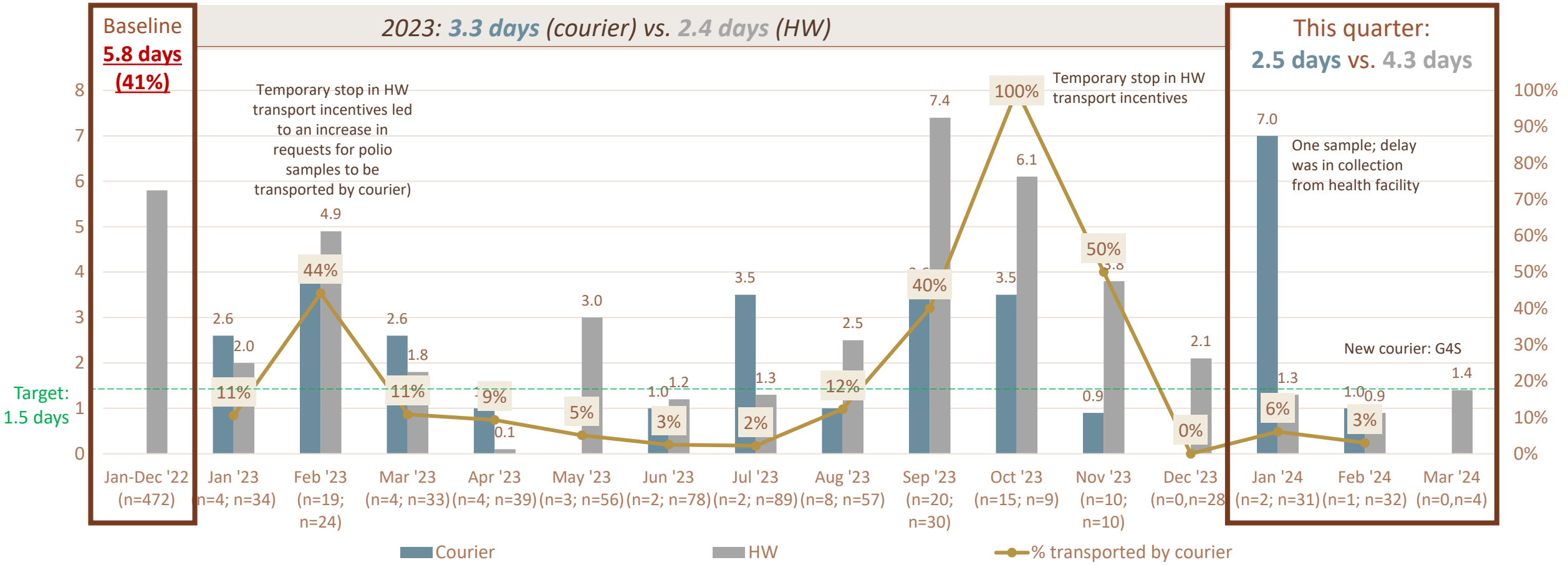


In Tabora region, few samples were collected during the pilot phase, but in the last quarter, transport to the national level averaged 2.5 days (vs. 4.6 days at baseline).

- *Note: Active case search supported by in-country partner CIHEB had uncovered most cases just before the pilot started.*
- *Tanzania Post transports other types of lab samples in country.*

Courier transport was promising but in low demand

Average # of days from sample collection (community/health facility) to **national capital (Lilongwe)**

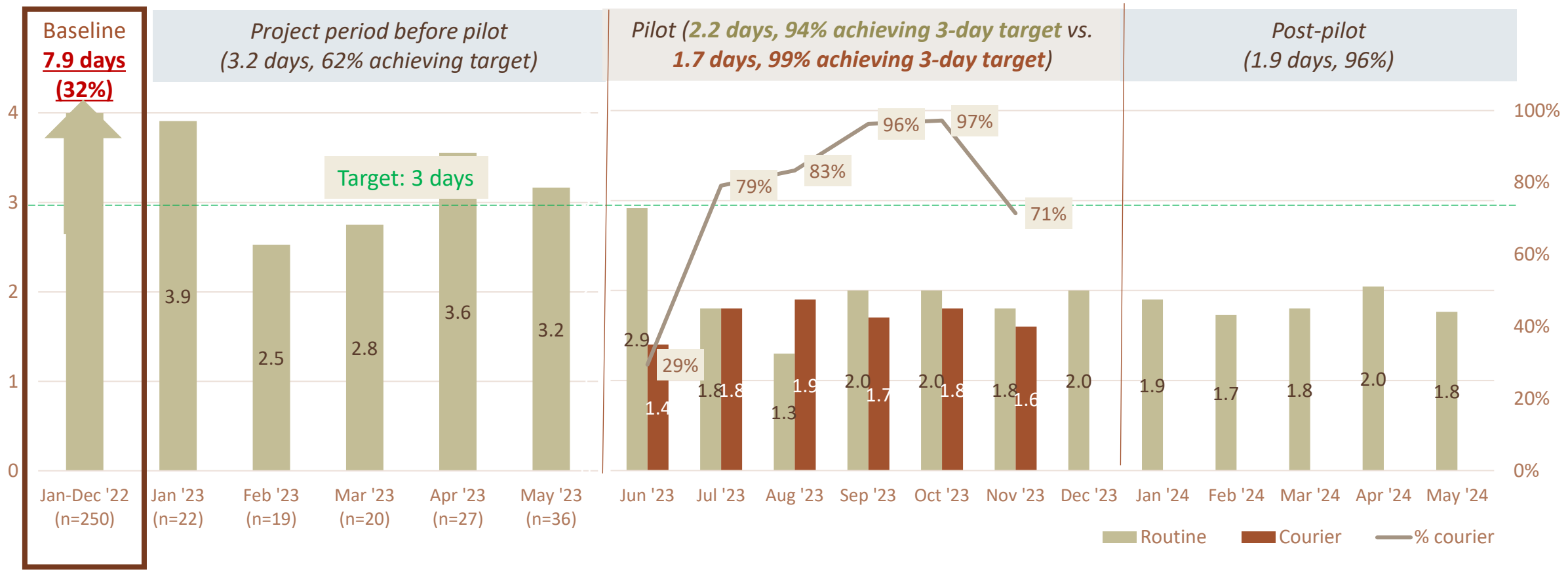


Private courier transport (R4H and SPEED in 2023, G4S since Feb'24) was in low demand due to health worker (HW) transport incentives (made available during the emergency period: Oct 2022-Mar 2024). But when used, courier transport was promising.

- *During the measles outbreak in Nov'23, EPI requested VillageReach begin transporting all measles samples countrywide (done via courier to date)*
- *While TA ended on 31 March in Malawi, this project will continue to pay for any measles & polio samples (courier transport) through 31 Dec '24.*

Commercial transporter demonstrated rapid transport times

Average # of days from collection (community/health facility) to **in-country labs**



After in-country partner CFHI contracted Riders 4 Health for a 6-month pilot, transport time dropped to under 2 days from collection to arrival at the testing lab, with most samples in the pilot LGAs transported by courier. Transport times remained low after the pilot.

Progress towards Objectives: Sample Quality (Condition/Temperature)

Photos: Denis Onyodi for VillageReach

SOLUTIONS CO-DESIGNED WITH MOH, WHO, STAKEHOLDERS

Biosafety, biosecurity, packaging and other SOP (re)training with MoH/WHO for health workers, surveillance officers, lab technicians at all levels & for private transporters

Extra **equipment & supplies** provided (fridges/freezers for transit points/hubs; sample carriers, ice packs, thermometers, triple packaging materials for health facilities & ES sites)

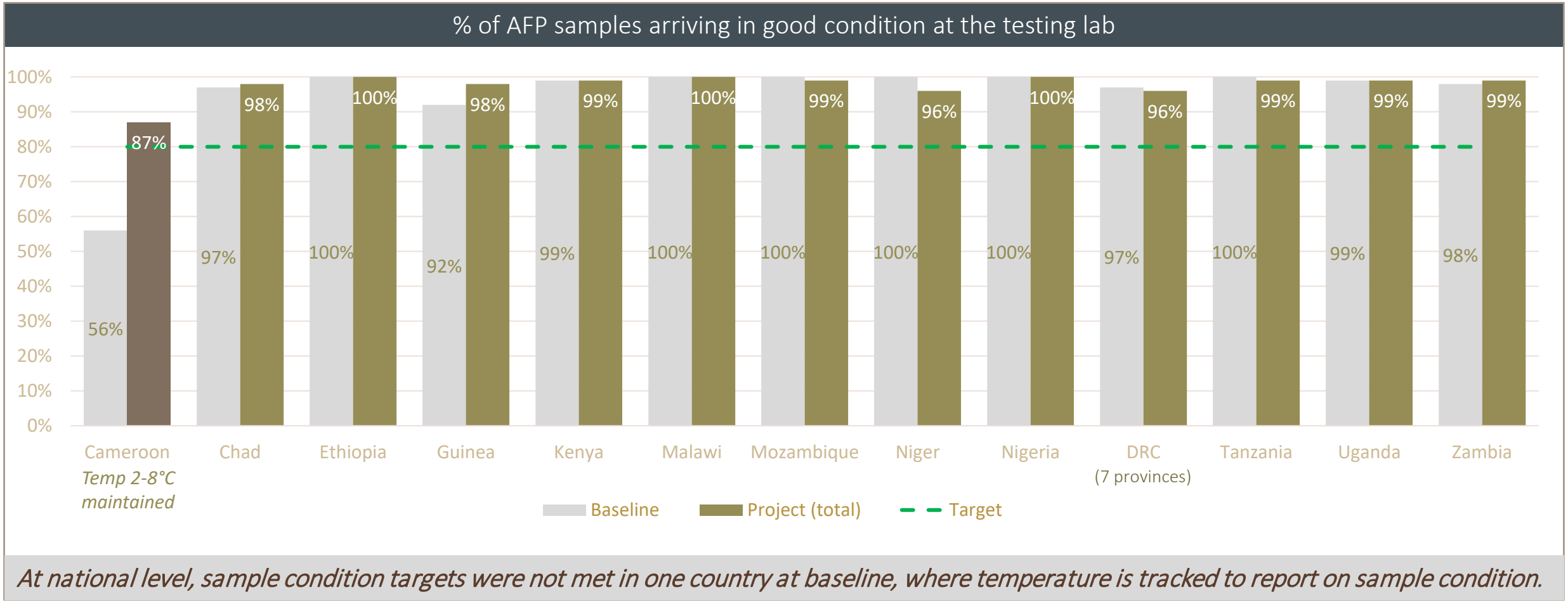
Temperature monitoring devices (log tags) to ensure samples travel within 2-8°C range, i.e. Tec4Med, Accent systems, Parsyl, U-TRIX

Dedicated staff to help MoH monitor log tags and ensure ice pack changes during transit & (re)packaging samples at transit points

New transit hubs (sample reception stations) established with MoH in distant/insecure areas where transport is slow/unpredictable/unsafe

AFP Sample Condition Across Countries

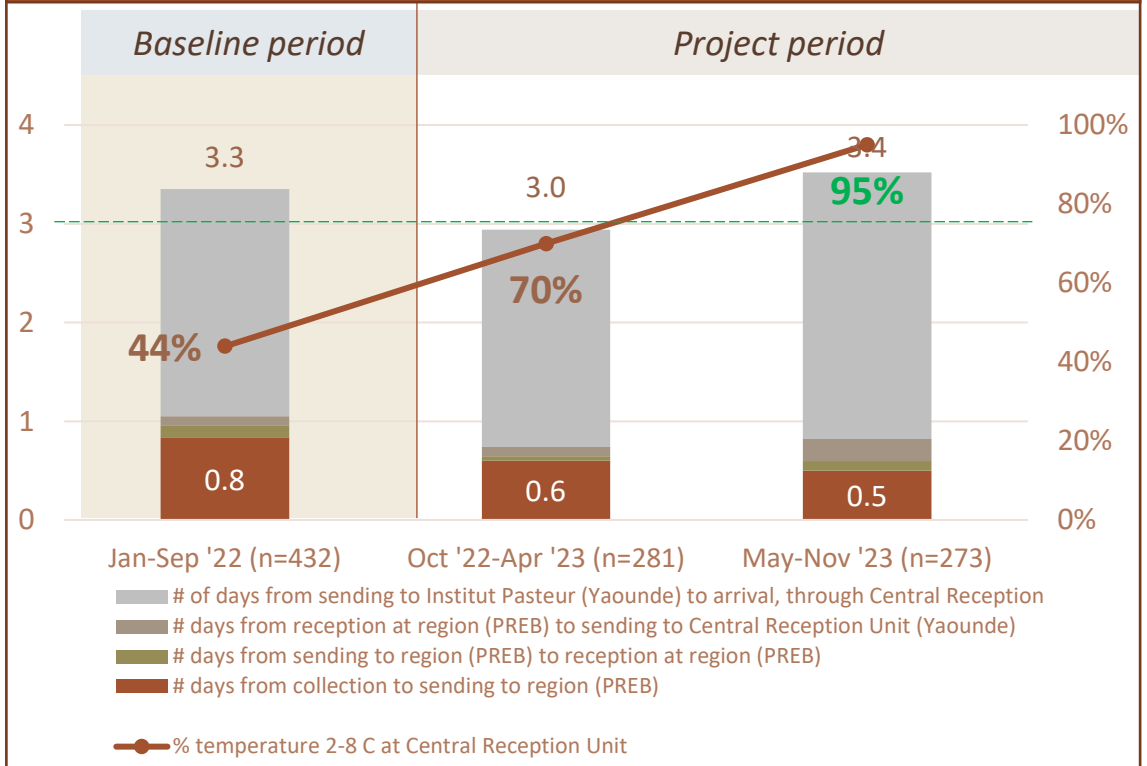
Our transport intervention monitored sample condition, one component of sample adequacy



At national level, sample condition targets were not met in one country at baseline, where temperature is tracked to report on sample condition.

Sample reception hubs, equipment & training for sample condition

Cameroon: IMPROVE



In the 2 project regions – including Extreme Nord where 2 new regional sample reception hubs were introduced with cold chain equipment added – transport timeliness was maintained (targeting 1.0 day through the regional level), while improving temperature maintenance (the proxy indicator of condition the MoH monitors).

Ethiopia: MAINTAIN

738 health staff trained across 220 districts

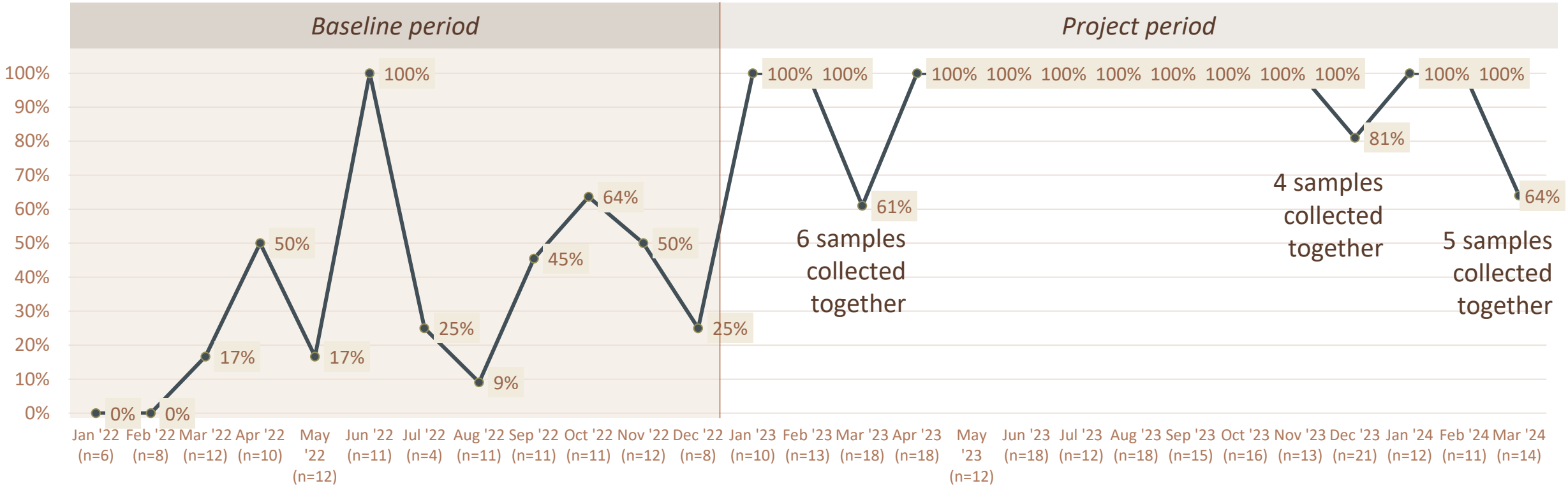
10 Freezers procured

2,000 remote temp monitoring log tags

The project established 10 temporary polio sample specimen hubs and equipped them with deep freezers. Training manuals were developed and health facility staff were trained. Sample condition was maintained at 100% throughout the project.

Equipment and mentorship ensure good condition

% of ES samples arriving at national lab (Lusaka) in good condition



In Zambia, Environmental Surveillance (ES) samples continue to achieve timeliness targets (1.5 days at baseline and 1.1 days during project period) and CIDRZ has resolved quality issues (100% good condition for 12 of 15 months).

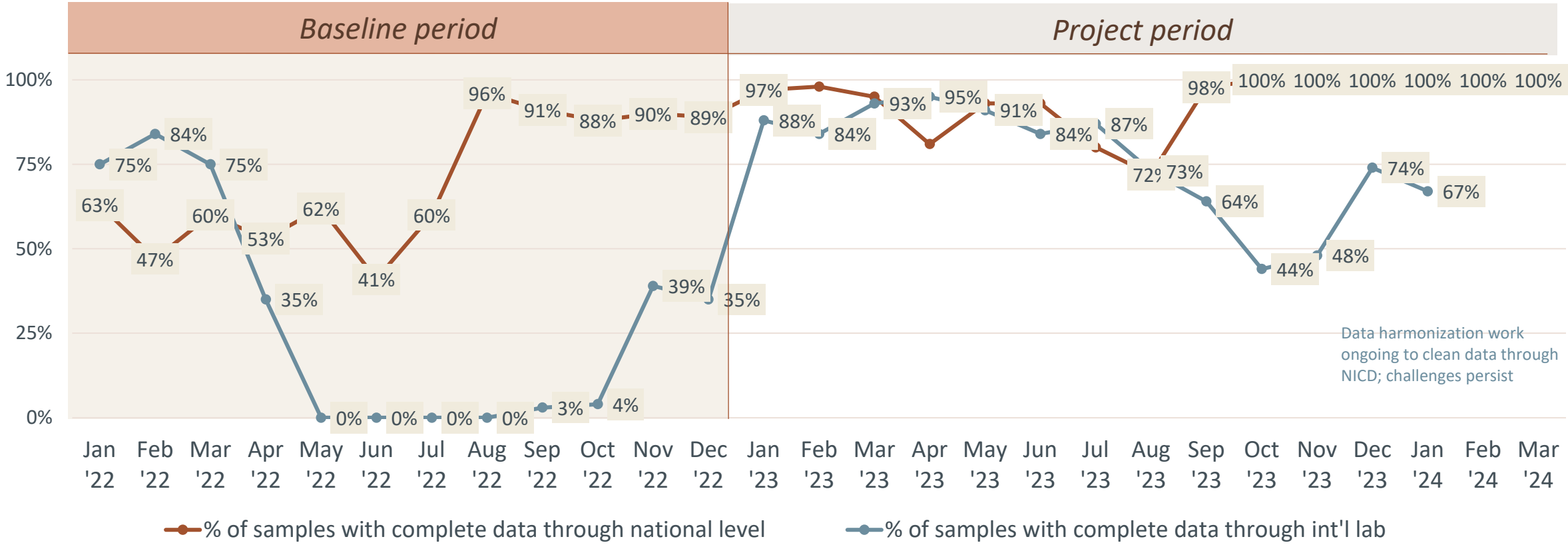
Progress towards Objectives:

SOLUTIONS CO-DESIGNED WITH MOH, WHO, STAKEHOLDERS
Regular data/performance reviews & harmonization between national MoH & international lab databases
Seconded staff/consultants or technical assistance to MoH Surveillance Departments or National EPI to enter missing data, clean and analyze the polio sample transport/CIF data
Centralized sample notification systems (USSD phone/SMS system in Malawi, AloVida health hotline in Mozambique)
Whatsapp groups for stakeholder coordination, sample notification, data verification and follow-ups with health staff and transporters when alerted by sample trackers
Dashboards provided in real-time by sample tracking devices
Digitization of Case Investigation Forms (CIFs) Unique case identifier issued by USSD system in Malawi Airtime for surveillance officers to verify CIF data

Data Quality & Visibility

Data harmonization exercises with EPI and WHO, Lilongwe. Photo: VillageReach

Capacity building and regular data reviews improve data visibility

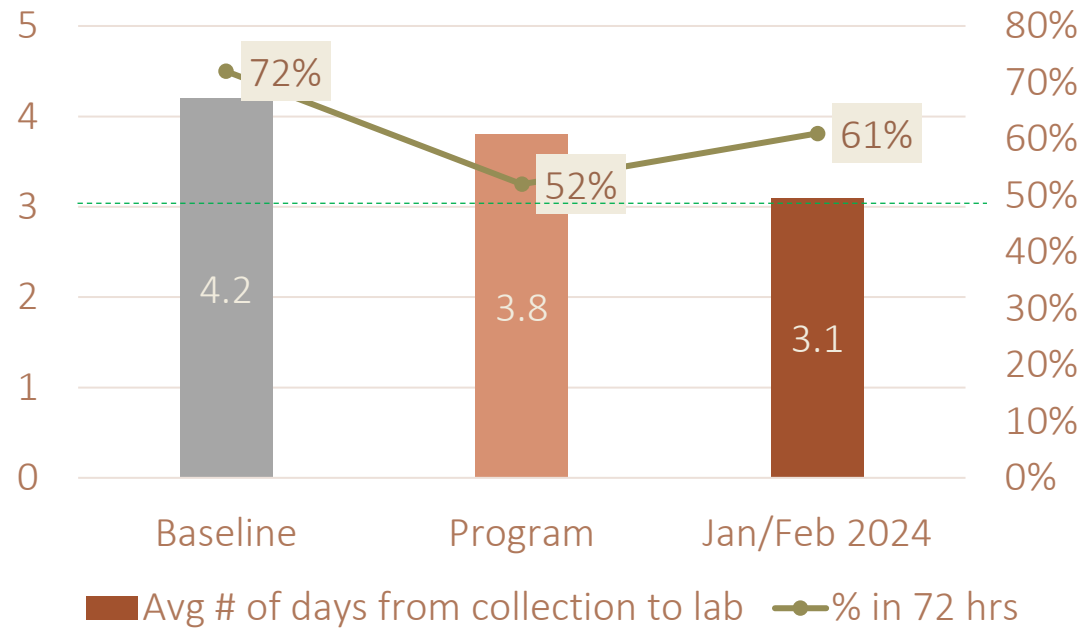


Through capacity building on the completion of case investigation forms (CIFs), data review meetings, and a data harmonization exercise, our project has contributed to consistent data availability to enable accurate monitoring through the national level.

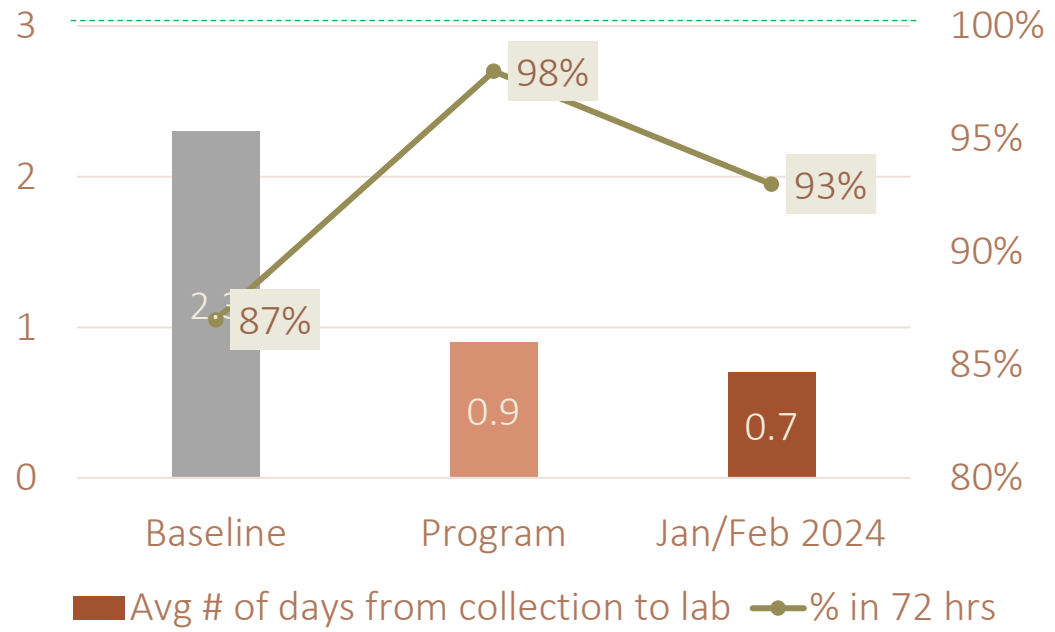
- *Note: While not in the VillageReach work plan, we hosted 2 data harmonization workshops with EPI and WHO (in Sep'23 and Mar'24) to review the int'l data through the NICD Lab & improve completeness in the EPI database (spreadsheet). EPI is continuing the exercise, however data availability between the national and international level continues to be limited.*

Integrated hub transport system maintained timeliness and quality

AFP samples



ES samples



Baseline period: Jan-July 2022
Program period: Aug 2022 – Mar 2024

# of days = Average # of days between sample collection & arrival at national polio lab
% in 72 hours = % of samples reaching the national polio lab within 3 days from collection

Tec4med devices: Lessons from 6 countries

Devices generate useful data, but logistics and incorrect or inadequate use can limit their value (per internal VillageReach + external MoH/partner interviews)

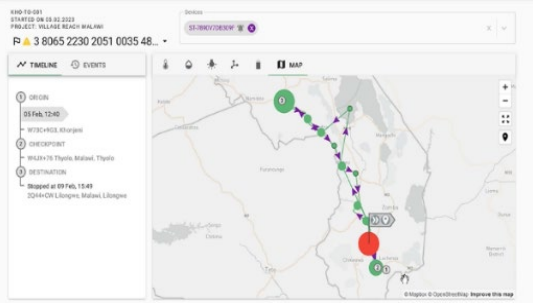
Tec4med.com

Advantages

- Enthusiastic receipt of devices in some countries, especially Kenya
- Praised as accountability mechanism in other countries (e.g., data used in trainings to reinforce importance of timeliness)
- Data can be used to plug gaps when other systems fail to generate timeliness data

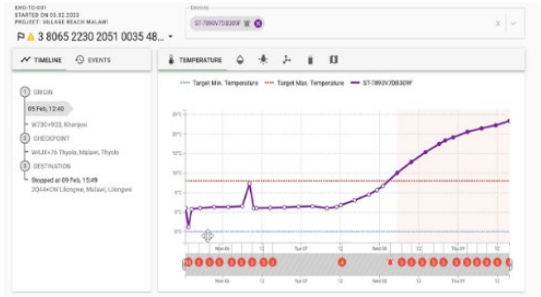
Challenges

- Logistical challenges with losing devices or returning them to proper location
- With improper use (e.g., not starting or stopping shipments on time), data can be hard to interpret
- Accuracy is not consistent in all geographies (depends on signal)
- Battery life depends on data reporting interval; in some settings, challenges with consistently keeping devices charged
- Dashboard easy to see and use, but aggregate analyses difficult
- Requires consistent monitoring which staff may not have time to do



Best uses

- Sample tracking over long distances, or when transport bottlenecks aren't well understood (target their use)
- When real-time location accuracy isn't crucial, allowing for utilization of other functions (i.e. temperature)
- If real-time location accuracy is crucial, supplier recommends using another version of the device that uses GPS technology for location triangulation (more expensive).



Transition to Government

Countries ending project developed transition plans & timelines with MoH, WHO and in-country stakeholders

30 Nov - 31 Dec 2023

29 Feb - 31 Mar 2024

31 May 2024

31 Dec 2024

1 Sustainability / Uninterrupted transport & service delivery

Who manages / who pays / who transports: If couriers, costing, contracting, (re)training + disease integration?

2 Legacy & Continued progress

What do we leave behind: Updated SOPs, best practices, data & documentation; post-transition monitoring of success?

3 Technology & Equipment

CCE & supplies: inventoried/transferred officially to local/nat'l govt.
Digital solutions: Subscriptions, data ownership, coaching MoH staff

4 Risk mitigation: Share data & advocate for adoption of successful project elements with funders/partners

Transition to Government: 9 countries + 1 province

Country	Design/partner/ project start-up	Full scale-up	Transition Date	Summary
Cameroon	Aug-Dec 2022	Jan-Nov 2023	Nov 30, 2023	Project officially ended in Nord and Extreme Nord provinces in Nov 2023. Our in-country partner Int'l Medical Corps continued to keep an eye on activities pro bono until Feb-March. Cameroon received more funding from other sources. In the 2 project provinces, health workers are still being reimbursed for transport of samples up to the provincial level, though the reimbursement isn't as high as during the project. The 2 new sample reception stations in Extreme Nord are being utilized. Tec4Med trackers were in late 2023 and their use continues as of now - annual fee prepaid.
Maindombe (DRC)	Aug-Dec 2022	Jan-Dec 2023	Dec 31, 2023	Maindombe had very few samples collected; transition workshop led to commitment from DPS and WHO for continuation of a combination of transport methods (private couriers and health staff).
South Sudan	Sep-Dec 2022	Jan-Dec 2023	Jan 31, 2024	MoH, WHO, & CGPP are continuing the activities of AFP stool samples from point of collection to county HQs and Juba NPHL, and the return of cooler boxes to their facilities (in the 12 project counties).
Kenya	Aug-Dec 2022	Jan 2023 - Feb 2024	Feb 29, 2024	Partner was MoH and activities are continuing through them, including expansion of Tec4Med devices.
Ethiopia	Aug-Dec 2022	Jan 2023 - Mar 2024	Mar 31, 2024	MoH/EPHI will continue use of the remote temperature monitoring (RTM) devices (U-TRIX). 9 temporary sample reception stations were opened in hard-to-reach areas and equipped with cold chain equipment. The CIF digitization process is finalized and validated from the EPHI technical team. MoH is integrating all digital solutions into the DHIS2.0 including e-CIFs.
Malawi	Aug-Dec 2022	Jan 2023 - Mar 2024	Mar 31, 2024	Technical assistance ended. VillageReach's Finance team is still paying private courier invoices for transport of measles and polio samples until 31 Dec '24. Tec4med devices are also pre-paid until that date, and R4H will continue supporting the national 'sample collection notification system' (USSD phone/SMS) that allows communications between all health facilities, transporters, district supervisions and national EPI. The team is having conversations with EPI who tried to put transport in their annual budget but may need to reduce the total cost. Also continuing conversations on integration with PHIM.
Tanzania	Aug-Dec 2022	Jan 2023 - Mar 2024	Mar 31, 2024	IVD and CIHEB are in conversations with WHO about continued support to have a dedicated person at the national sample packaging center, as this was an impactful intervention.
Uganda	Aug-Dec 2022	Jan 2023 - Mar 2024	Mar 31, 2024	Discussions ongoing between UVRI, MoH, VR and WHO to ensure Polio samples are integrated into the National Hub System, based on the results from our pilot project & cost analysis in 30 districts.
Zambia	Aug-Oct 2022	Nov 2022 - Mar 2024	Mar 31, 2024	WHO took over funding for sample transportation in the 7 provinces previously supported by CIDRZ/VR. ZNPHI and WHO agreed funds will be maintained at the Provincial Health Officers and payment will be done at this level to HWs for transport. ZNPHI is seeking further funding to operationalize the interoperability of DISA, eIDSR and polio lab information systems. It is expected that this will facilitate more efficient data management practices.
Nigeria	Aug-Dec 2022	Jan 2023 - May 2024	May 31, 2024	Project ending on May 31. Transition workshop was moved by Government to June.

VillageReach
Merci !
Obrigado!
Thank You!