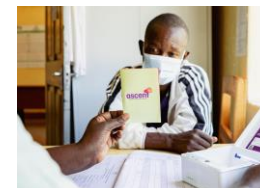# Digital Adherence Technologies: Budgeting

Global DAT Task Force

Webinar: Budgeting for Digital Adherence Technology Implementations in National TB Programmes

16 March 2023

Agenda

- Overview of costing for DATs

    Inez de Kruijf – Carter *(Global DAT Task Force)*

- Costing experience of video supported treatment in Moldova:

    Cristina Celan *(PAS Center)*

- Costing experience of the Smart Pill Box in the ASCENT project

    Job Van Rest *(KNCV Tuberculosis Foundation)*

- Where do DATs fit within a Global Fund application

    Inez de Kruijf – Carter *(Global DAT Task Force)*

Overview: What goes into a DAT intervention?

Adherence Platform (software costs)
Hosting (global/local/on-premise)

In-hand technology costs for person on treatment

In-hand technology costs for healthcare provider

Human resource support for implementation sustainability and success

Implementation of 3 year
2000 people enrolled per year

Smart pill box

Line Item

Video Supported Treatment

	TECHNOLOGY COSTS	
USD 170 000		USD 1.4 million

	SOFTWARE COSTS	
USD 180 000		USD 190 000

	HUMAN SUPPORT	
Country dependent		Country dependent

Implementation and scale-up of video-supported treatment of tuberculosis

Cristina Celan, Programme Coordinator,
Center for Health Policies and Studies (PAS Center)

Republic of Moldova

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GENERAL / BACKGROUND

VST model of care and technology used

- Asynchronous locally developed VST solution – I LIKE VST, www.tbvot.md, specialised VST software;
- Both DR and TB sensitive patients are eligible for inclusion;
- VST a regular option for TB treatment included in the National TB Protocol;
- Inclusion criteria –
1. Person with TB over age 18 years (legal age of informed consent).
2. Outpatient from day one or discharged from the hospital, demonstrating 100% adherence to DOT on an outpatient basis for at least 14 days;
3. Patient who has signed the informed consent regarding VST.
4. Patient who has the ability to administer TB medicines independently (according to the prescribed scheme and regimen), in strict accordance with the instructions of the web application, after being trained by the personnel involved in VST.
5. Patient who has the ability to use electronic device after receiving training.

What are the results

Year	Total started ambulatory treatment	Total enrolled in VST	Cured	Excluded from VST	Still in treatment	Transferred DOT/hospital	LFU	Death
2020	1275	242 (19%)	196 (81%)	28 (12%)	0 (0,004%)	18 (0,07%)	0	0
2021	2259	244 (11%)	192 (79%)	31 (13%)	3 (0.01%)	13 (0.05%)	3 (0,01%)	2 (0,008%)
2022	1920	304 (24%)	142 (47%)	28 (0,09%)	120 (40%)	12 (0,04%)	1 (0,003%)	1 (0,003%)
Total	5454	790 (14%)	530 (67%)	87 (11%)	123 (16%)	43 (0,05%)	4 (0,005%)	3 (0,004%)

PLANNING AND START-UP

VST Implementation Experience

2015-2018
- VOT pilot project implemented by NGO "Act for Involvement" (AFI) in Chisinau municipality in partnership with the NTP, UNDP, BIT and with the support of the PAS Center. The results of the project showed that under VOT:
- the duration of non-adherence period within 2 weeks decreased by 4 days compared to DOT
- VOT patients spent 25 euros and 58 hours less on treatment compared to DOT patients
- increased patient satisfaction with VOT

2018
- The "Guideline for the organization of video-observed tuberculosis treatment (VOT)" was developed within the framework of the GF TB project
- The platform I Like VST platform was improved and adjusted by PAS Center in partnership with NTP and AFI within the framework of the project "People centered TB care in Moldova: scaling up digital treatment adherence approach", supported by the TB REACH Initiative of the Stop TB Partnership (USD 423,250 for platform development, equipment for HCW, patients, trainings, communication costs).

2019
- Revised, updated and approved at the level of the Ministry of Health and Social Protection (March 2019) - Guideline for the organization of video-observed tuberculosis treatment (VOT)
- Trained medical staff of TB cabinets from 14 healthcare institutions (April 2019)
- VOT system ready to use and institutionalized (June 2019)
- Submission of documents for registration in the system of the National Center for Personal Data Protection (August 2019 - in progress, suspended in February 2020 due to COVID-19 situation).

2020
- The first case of COVID in the Republic of Moldova - March 8, 2020, county's under quarantine - March 15 2020
- The National Tuberculosis Control Program in Moldova and its partners developed an algorithm for the rapid implementation of VOT in Chisinau municipality with subsequent expansion at the country level, approved by the Order of the Ministry of Health and Social Protection No. 115d of March 30, 2020
- April 2020 - the implementation of the I Like VOT app for TB patients monitoring was launched

2021
- Countrywide scale-up under the GF 2021-2023 program and strengthened CSO support through C19RM allocation 2021-2023.

Context for VST implementation

- Moldova - high DR-TB burden country;
- Part of low treatment adherence in DR TB linked to inconvenience of DOT as single strategy in outpatient care.
- TB stakeholders developed an asynchronous VST electronic system and model of care (2019) as an additional adherence tool for people with TB who report difficulties with DOT.
- The VST model - particularly timely during Covid-related restrictions of visiting health facilities.
- Total budget for roll-out - USD 423,250 for platform development, equipment for HCW (31 facilities), patients (300 pers), trainings (98 HCW), communication costs (15 months), supported by the TB REACH Initiative of the Stop TB Partnership.

Speed roll-out of VST during COVID-19

- MoHLSP ordinance from March 30, 2020 to start the VST roll-out during the pandemic situation;

- Gradual enrollment and coverage of the territories.

- Gradual training of TB staff and continuous support to them.

- Technical support and gradual transfer to knowledge to the NTP staff

- Gradual roll-out of the VOT in all the targeted territories.

Challenges in implementation

- Lengthy and bureaucratic process of registering the system at the CNPDCP;

- Implementation of VST on the left side of the Dniester (local requirements for telephones, one single provider of internet services, etc).

- Lack of additional financial resources needed for updating the platform, as in the beginning the system needed several updates of the application to eliminate all bugs and make it functional.

IMPLEMENTATION ARRANGEMENTS

Implementation arrangements and regulatory landscape

MoH

PNRT

Implementation partners (GF PR, SR, CSOs)

TB specialists in districts centers

TB Specialists in PHC centers in Chisinau
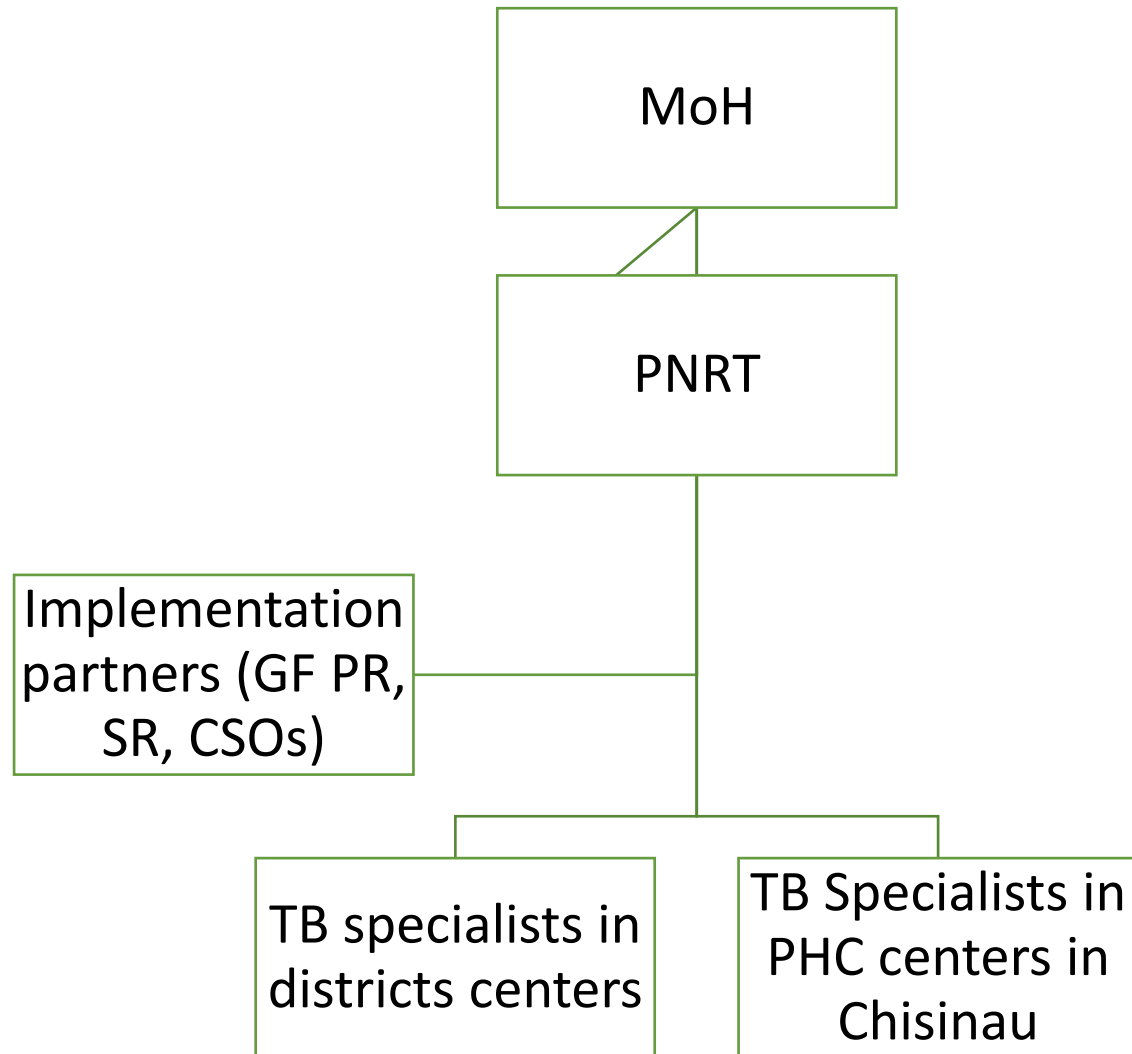
VST implementation is regulated by

| National TB Response Programme (2021-2025) | National TB Clinical Protocol | Guideline on VST implementation, aproved by MoH | MoH Order of VST implementation during pandemic situation |

Data collection, analysis and reporting

Data is collected exclusively through the VST system and triangulated with SIMETB;

I LIKE VST system is interoperable with other systems;

For programmatic purposes, data is analyzed monthly;

Adherence rate and treatment success rate among patients in VST are used to track the progress and implementation of VST
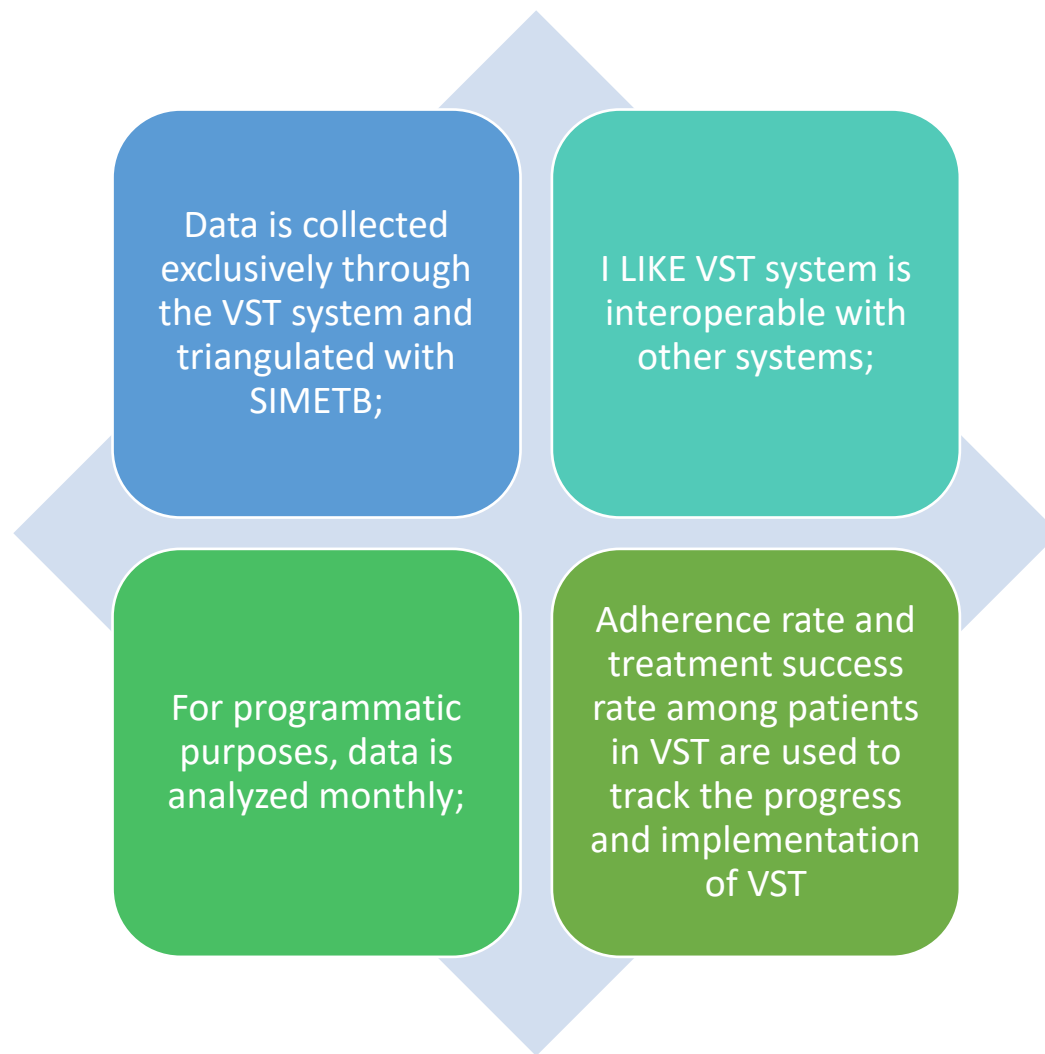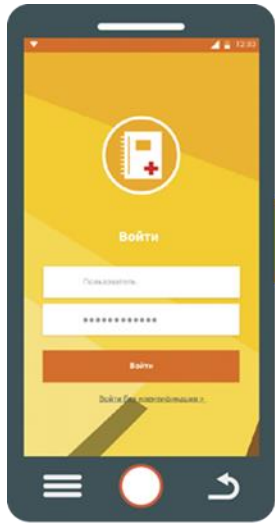
1. The patient is informed about the possibility to undergo VOT treatment

2. The patient signs an agreement to be included in the VOT and an agreement on the processing of personal data

3. The patient creates an account at **www.tbvot.md**

4. The doctor fills out the patient profile with information about the treatment regimen

5. The nurse releases medications to the patient for 2 weeks

6. Every day, the patient transmits a video of taking medication

7. The doctor/nurse watches the video and evaluates the quality of medicine intake

8. The doctor/nurse records a response video for the patient (encouraging or guiding message)

Lessons learned

- VST is a routine option of TB care, implemented country-wide (including districts on the left bank of the Nistru river);

- Patients receiving treatment at a convenient time and place show an increased level of adherence;

- Medical staff maintain daily contact with patients, while receiving more up-to-date information on side effects;

- Strengthened interaction of NTP with NGOs in the provision of TB services;

- CSO partners provide ongoing technical support to patients receiving VST;

- HCF facilities and TB patients are equipped accordingly and communication costs are covered where needed.

2020

2021
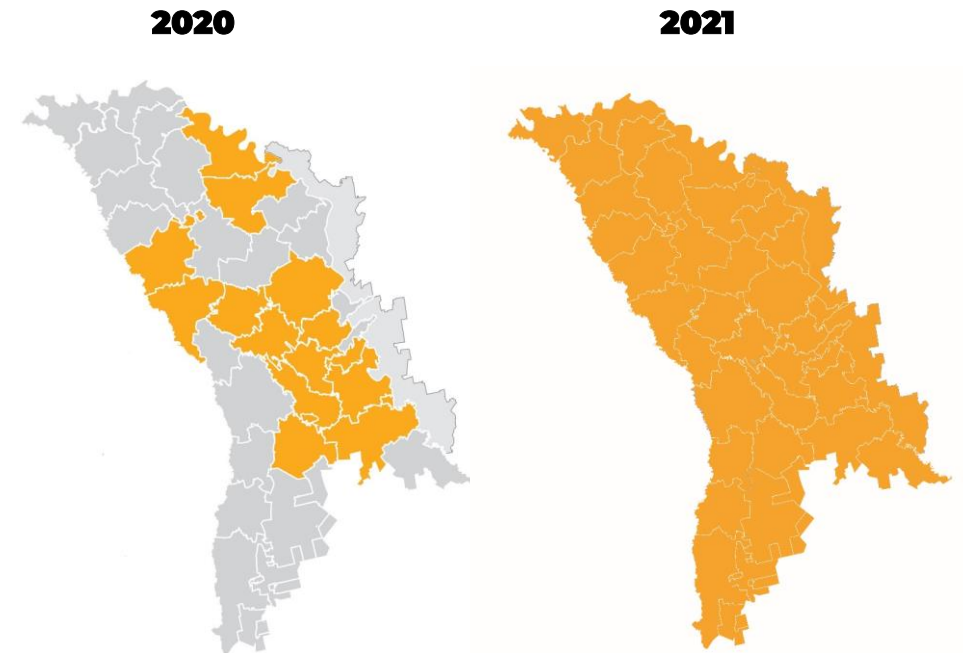
Budget considerations

- Data costs for patients and HCW – for patients (290) only data (5 GB) 1 USD/month; for HCW (61) unlimited package – 9USD/month. Total 750 USD monthly bill.
- Equipment – mobile phones for patients, including protection glass and cover 120 USD (995 units 2020-2022); PC+wi-fi routers for HCW – 5000 USDx55 sites
- Platform setup and maintenance costs – 40000 USD, 4000 USD maintenance annually. Adaptation – 7000 USD.
- Platform web/local server hosting costs – 100 USD registration, 25 USD annually; 30 USD for placement on Google market+17 USD monthly GSuite.
- Hosting costs for video storage – 2500 USD annually.
- Human resources for implementation (DAT coordinator; training; technical support; etc) – 27 USD per enrolled, trained patient and additionally 14 USD per adherent patient during first 2 months.
- Ongoing costs – costs for transportation, M&E visits.
- Any other costs that were linked to VST planning & roll out – design, informational materials (posters, video tutorials), boxes/packages for pills, printing of patient information, TA.

SUSTAINABILITY

Ownership, stewardship and funding

- VST system is the ownership of the NTRP since June 2019;
- VST programme is managed by the NTRP, with the support of PAS Center.
- Currently the intervention is fully supported through GF grant implemented by UCIMP, till the end of 2023.
- Further advocacy for changes in the method of payment for TB staff overtaking PHC tasks of daily TB treatment support is needed to ensure the sustainability of the intervention, along with securing funding for equipment, communication costs and patients' mentorship.

Costing experience of the Smart Pill Box in the ASCENT project

Job van Rest – Digital Health Consultant
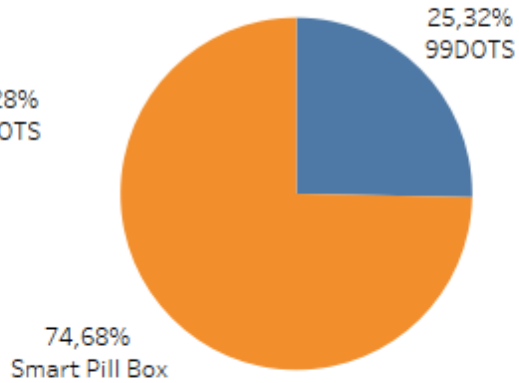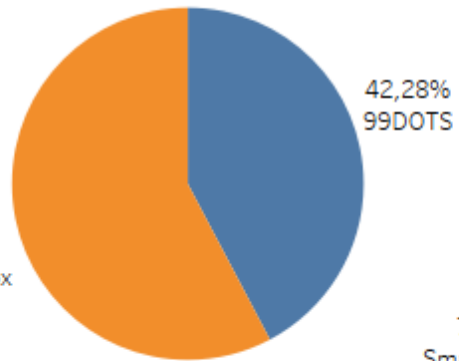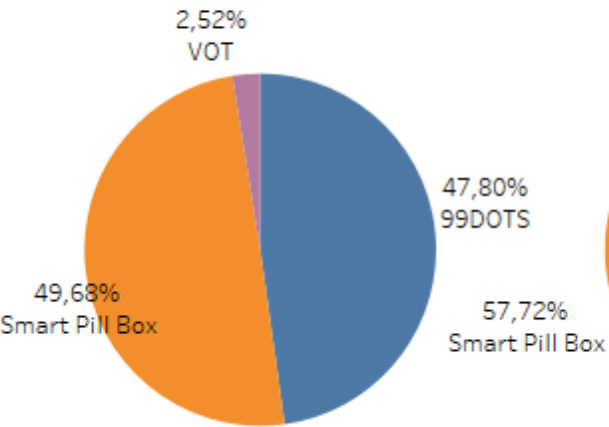
KNCV Tuberculosis Foundation

Webinar: Budgeting for Digital Adherence Technology Implementations in National TB Programmes

16 March 2023
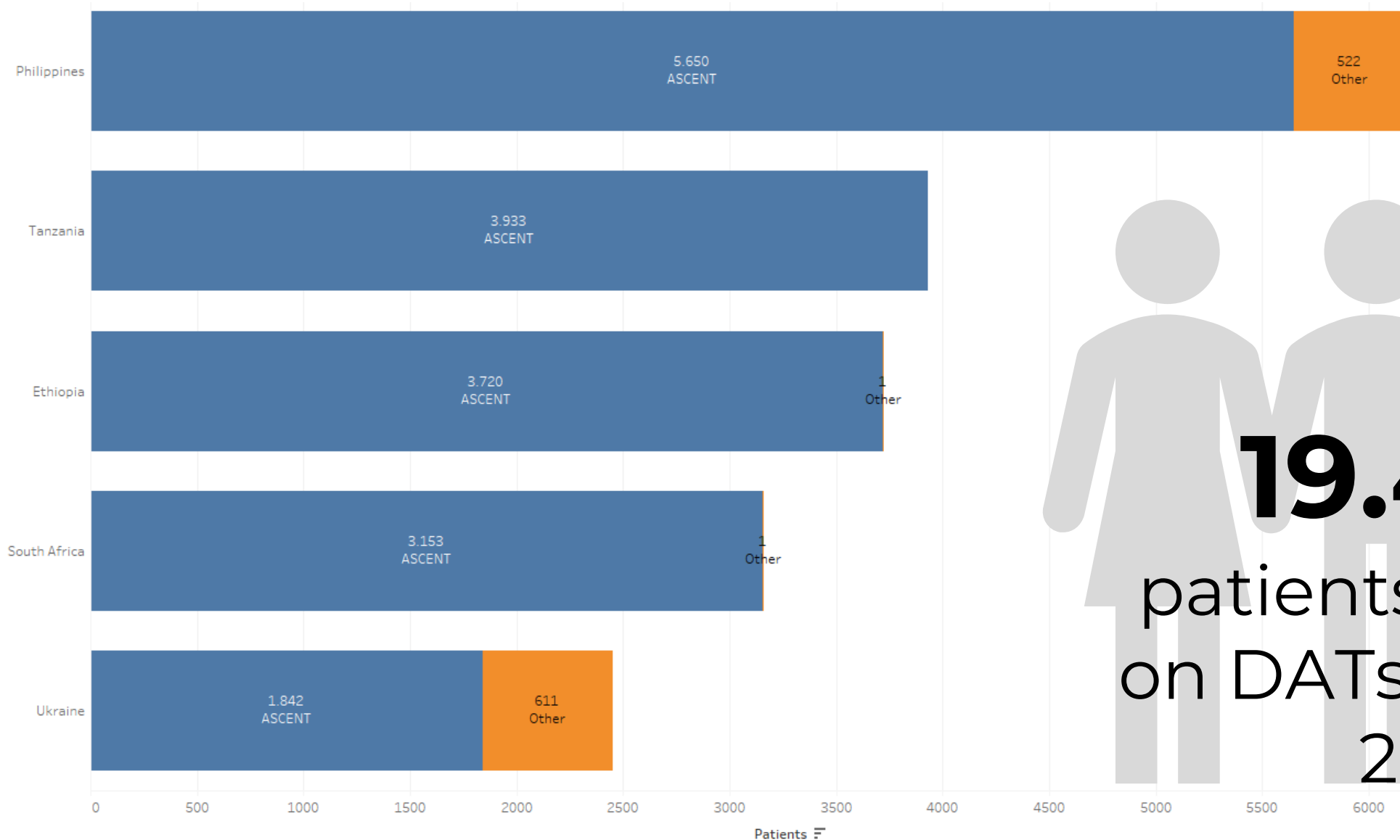
19.400

patients enrolled on DATs since Jan 2021
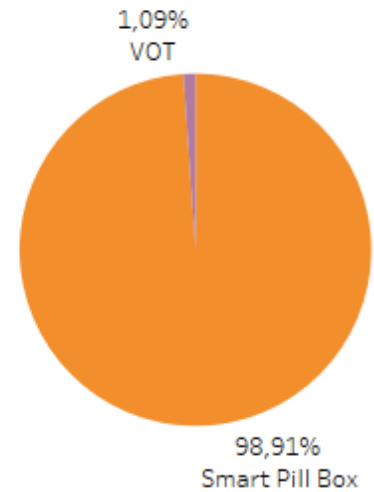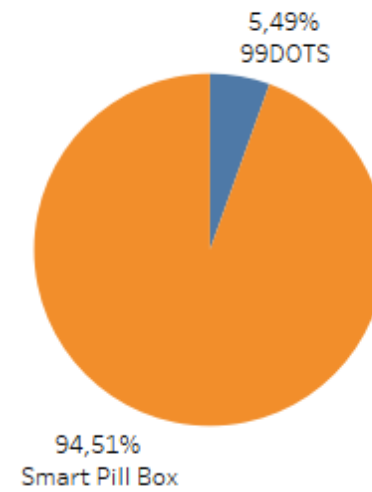
The **smart pill box** is most used

Smart Pill Box

|	
Smart pill box kit from GDF *(includes module; battery, charger; and plastic container)* *	$27.75 per kit
Mobile data 12 months	$ 12.0 per year
Replacement plastic container	$ 2.50 per container
Medication instruction labels and booklets	$ 0.30 – $ 0.50 booklet + label
Shipment of boxes from South Africa	Quantity & country dependent

* A smart pill box kit can be reused for multiple people – therefore reducing costs per person over time.
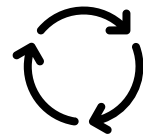
6 months battery life (*chargeable via USB*)
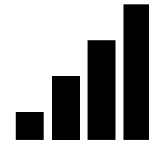
36 months worldwide data services

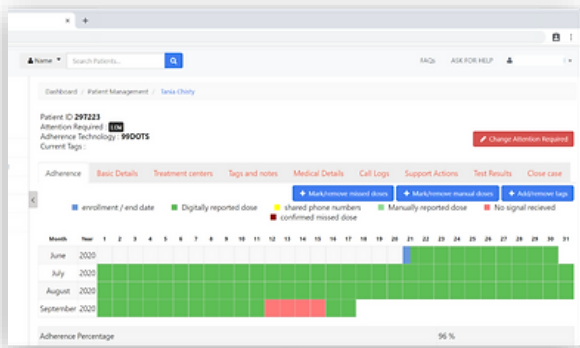Chip can be **re-used** for multiple (>3) patients

$ 53.75 per kit
Usable for multiple patients)

The smart pill box made directly available for procurement via **Global Drug Facility (GDF)**

Software Costs: Adherence Platform

Once-off platform setup and customization	Provider dependent	~ $ 10.000 – $ 20.000
Contractual costs (monthly):	Provider dependent & number of enrollments per year	~ $ 4.200 per month; 2000-4000 patients per year
Engineering support: Maintenance / bug fixes and software updates	*Provider / Service Level Agreement dependent*	~ $ 1.800 per month
Platform web hosting (global / local / on-premise)	*Country requirements & provider dependent*	~ $ 1.800 per month
L2 technical support (helpdesk)	*Provider / Service Level Agreement dependent*	~ $ 600 per month

Surrounding technological infrastructure costs

| Tablets / laptops per healthcare facility to access adherence platform software *	Approx. $250 per device (country dependent)
Monthly data bundle for healthcare providers to access adherence platform software *	A range of $5-$16 per device, per month

Opportunities for cost-sharing between different programmes, such as HIV/TB programme and making use of existing hardware.
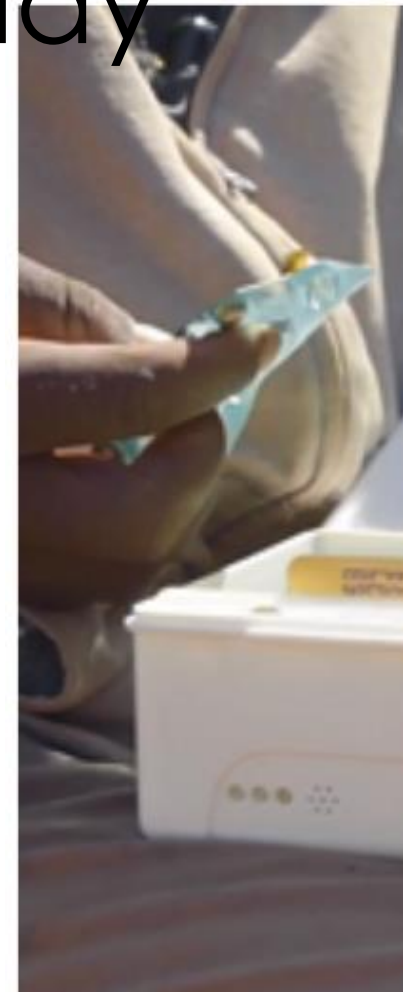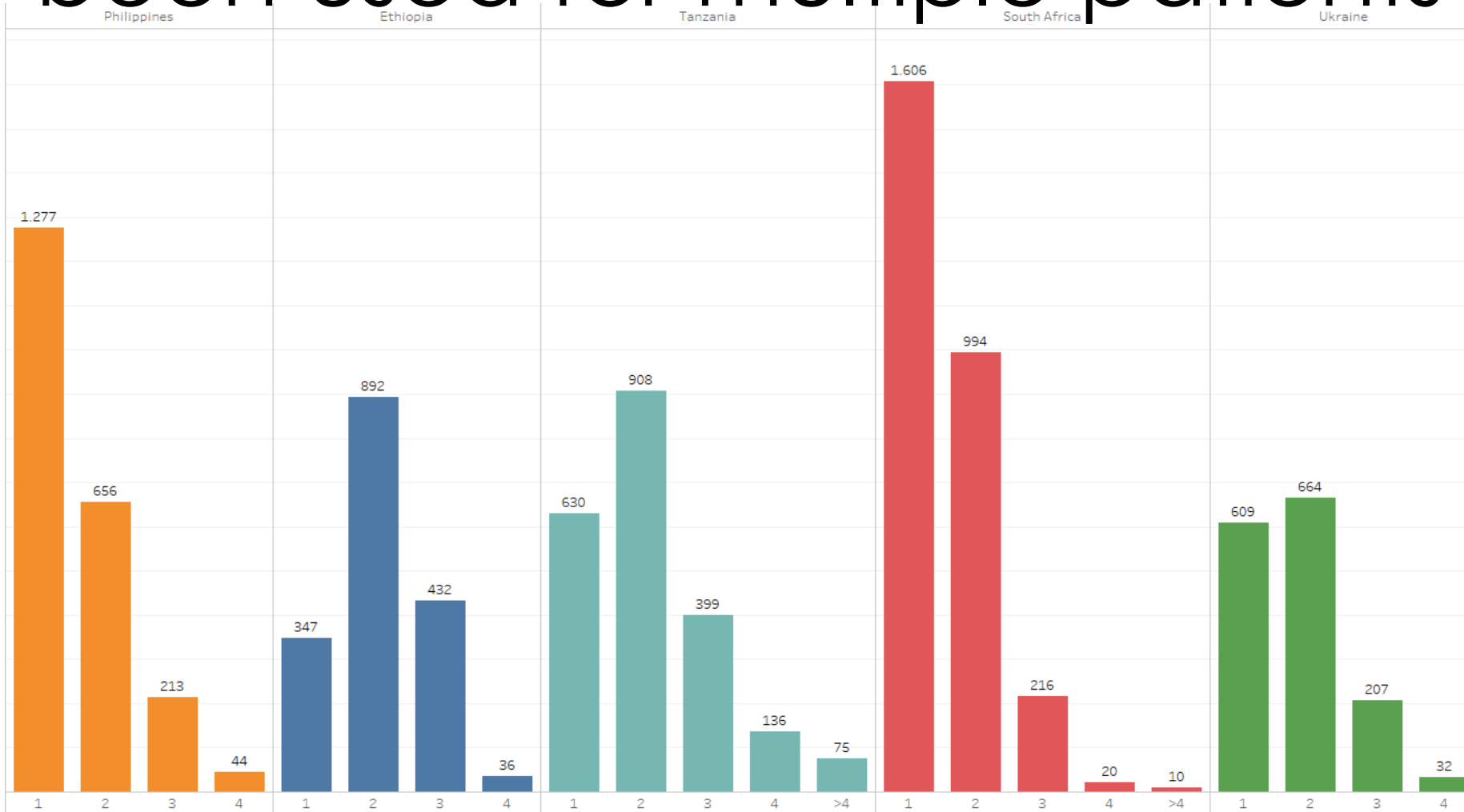
Human resource for successful implementation

DAT coordinator *	Country dependent
In-country technical support *	Country dependent
Training and capacity building + refresher training	Country dependent

* Opportunities for cost-sharing between different programmes, such as HIV/TB programme.
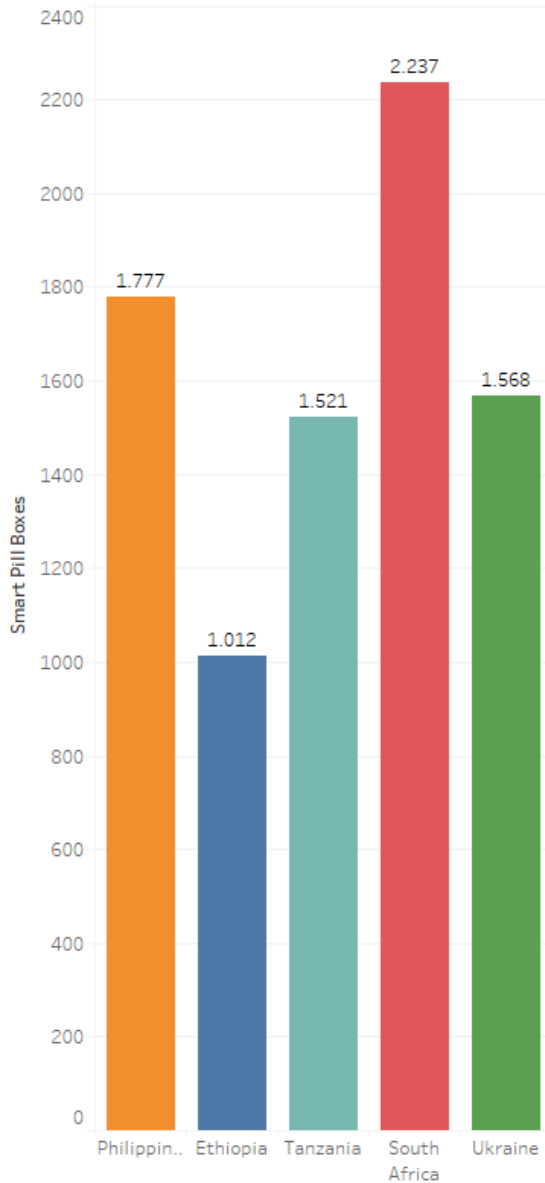
more than **8.000** smart pill boxes procured and distributed to patients

Over 60% of the **smart pill boxes** have been used for multiple patients already

Philippines	Ethiopia	Tanzania	South Africa	Ukraine
1.277, 656, 213, 44	347, 892, 432, 36	630, 908, 399, 136, 75	1.606, 994, 216, 20, 10	609, 664, 207, 32

Project Cost Estimates per Patient (4,000 patients) Tanzania Pillbox

1 Year
$56.9
Per Patient

Platform Hosting,
Maintenance & updates
Remote L2 tech support
DAT Procurement

$42.6 (DAT ONLY)

2 Years
$45.2
Per Patient

Platform Hosting
Maintenance & updates
Remote L2 tech support
DAT Procurement

$30.9 (DAT ONLY)

3 Years
$39.6
Per Patient

Platform Hosting
Maintenance & updates
Remote L2 tech support
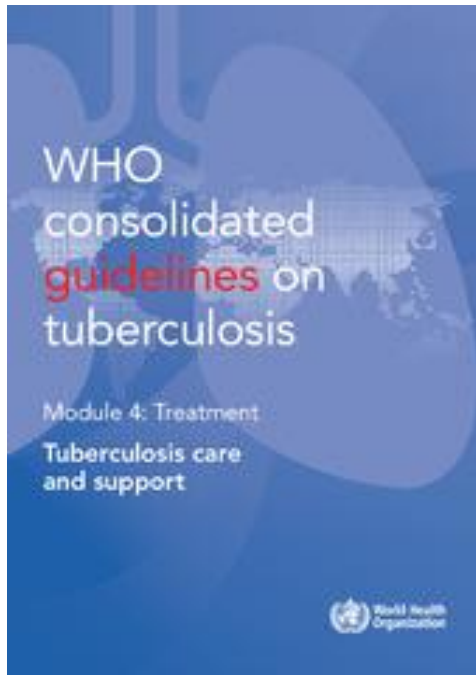DAT Procurement

$25.3 (DAT ONLY)

The cost doesn't include training s, ICT devices, or human resources costs. These may be required depending on the implementation scenarios

# Where do DATs fit within a Global Fund application?

WHO 2022 updates

"the evidence [...] showed that, **when patients received treatment adherence interventions** (e.g., different combinations of patient education, staff education, material support, psychological support, tracers and *use of medication monitor*) in conjunction with treatment support or SAT (self-administered treatment), **the treatment outcomes were significantly improved compared to treatment support with observation or SAT alone**".

SMS and EMM (smart pill boxes)– which can operate without mobile broadband Internet coverage – are currently the *most accessible, affordable and easily expandable treatment support approaches in resource-limited settings*.
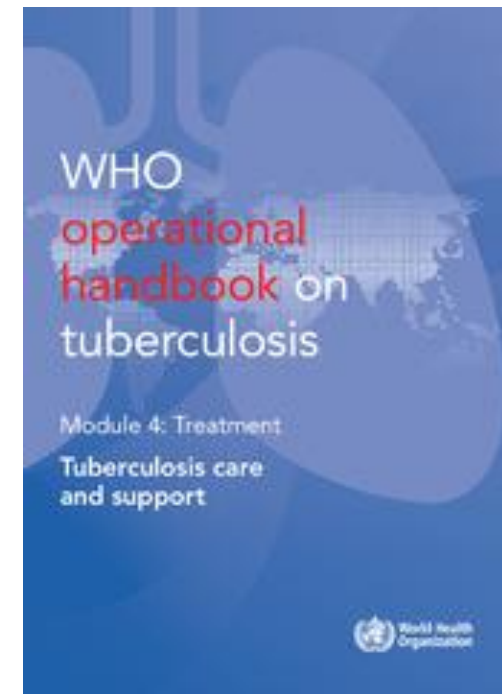
WHO 2022 DR-TB update

"**missing doses of all three or four drugs in the regimen should be avoided**". For this reason, the inclusion of treatment support in the BPaL(M) roll out is vital: "**measures to support patient adherence tailored to patient needs are important to retain patients on treatment and ensure good treatment outcomes**. Support should be provided through an effective model of care and measures should include support in the community or at home, social support and digital health interventions for communication with the patient."
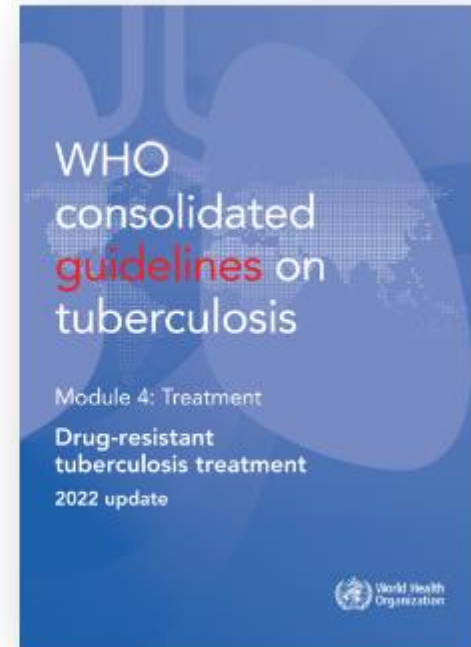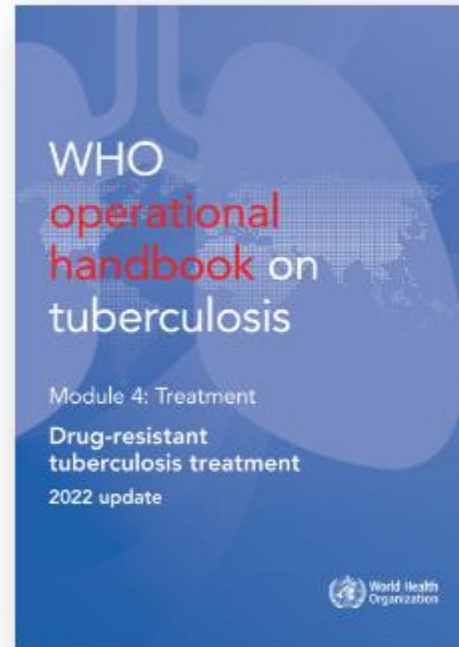
Global Fund Strategy for 2023-2028:

> "Support all people with TB to access appropriate quality TB treatment and to successfully complete their medications through the adoption and scale-up of latest **digital adherence technologies**."

Global Fund Information Note (July 2022):

> "**Digital adherence technologies** can significantly de-stress the pressure on health care facilities, while meeting the service user needs and preference"
>
> "Countries should consider transitioning to the shorter, novel 6-month all-oral regimens (BPaLM or BPaL)"

- DATs are **prioritized for GF allocation period 2023-2025** under the modules:
    - Treatment and care
    - Drug – resistant TB: Treatment and Care (DATs & BPaL / BPaL-M)
- **C19RM grant**
- **Current grant reallocation / above allocation funds**
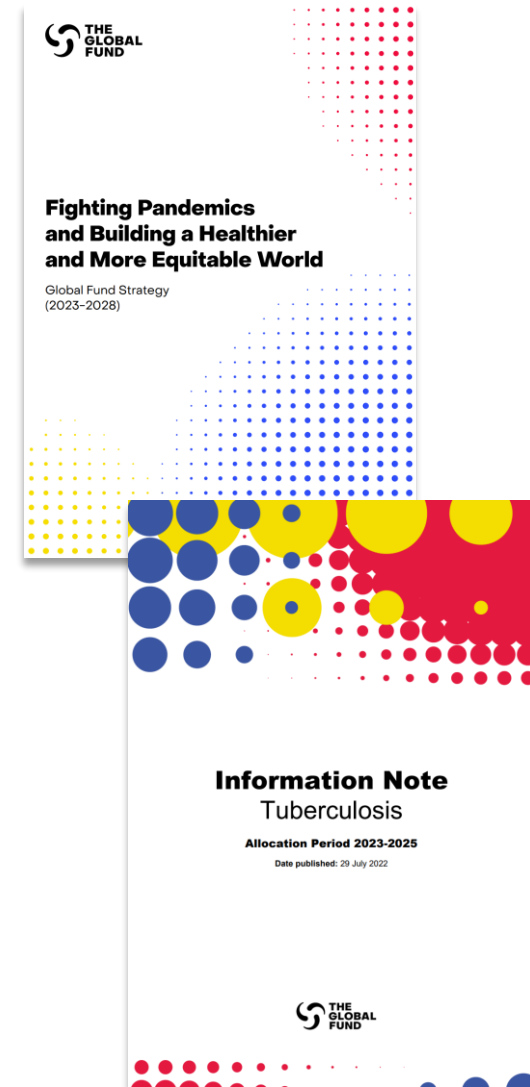
Per person cost: Smart Pill Box

2000 people enrolled per year	
1 year	USD 87.05
2 years	USD 68.92
3 years	USD 57.55
5000 people enrolled per year	
1 year	USD 67.05
2 years	USD 52.92
3 years	USD 42.88

* Excluding human resource costs
** reuse of the smart pill box module is assumed for a 2 and 3 year implementation period

Per person cost: VST

Including mobile device and data for patients

2000 people enrolled per year

1 year	USD 338.42
2 years	USD 289.17
3 years	USD 269.42

5000 people enrolled per year

1 year	USD 318.42
2 years	USD 273.17
3 years	USD 254.75

Per person cost: VST

Excluding mobile device and data for patients

2000 people enrolled per year

1 year	USD 46.42
2 years	USD 37.17
3 years	USD 34.09

5000 people enrolled per year

1 year	USD 26.42
2 years	USD 21.17
3 years	USD 19.42

* Excluding human resource costs
** reuse of mobile phones is assumed for a 2 and 3 year implementation period

Thank You!

www.tbdigitaladherence.org

secretariat@tbdigitaladherence.org