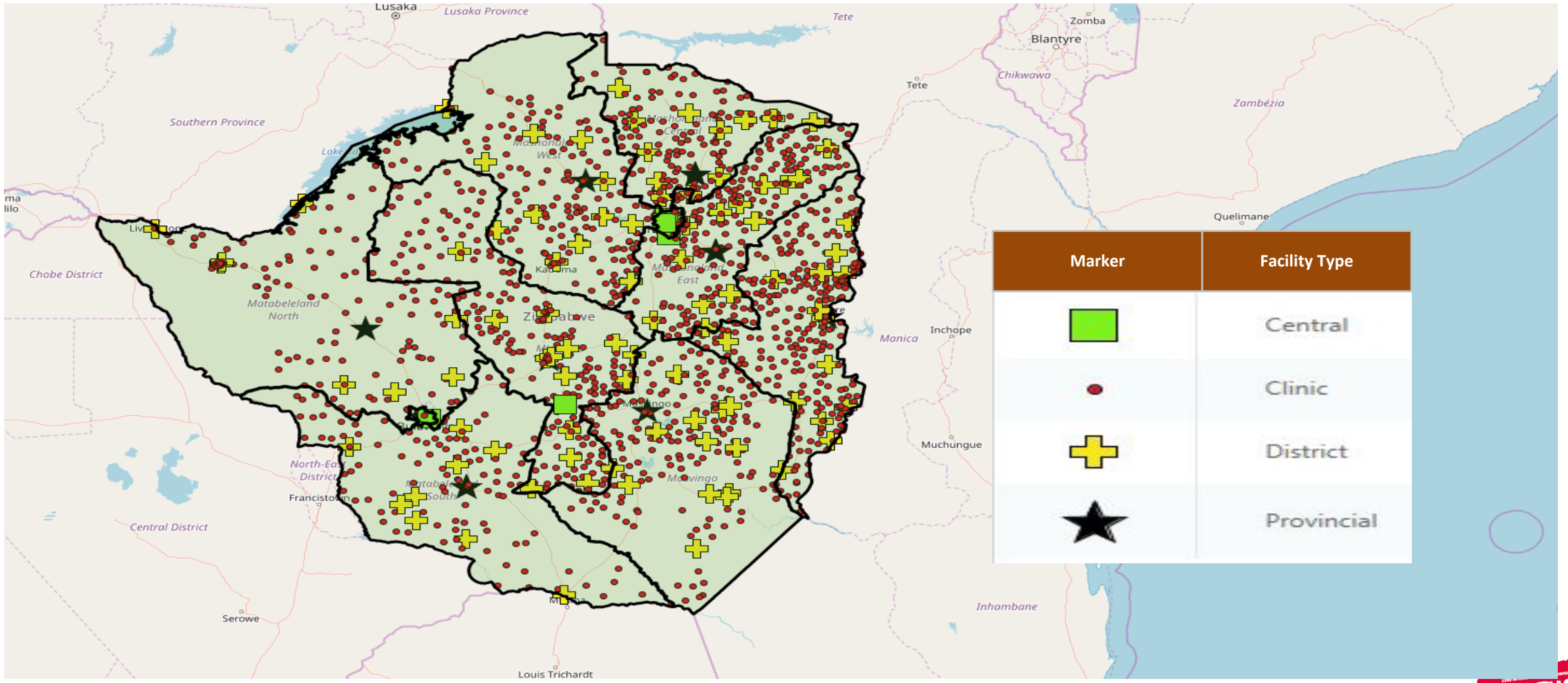
Leveraging investments in Diagnostic Networks Optimisation to expedite planning and implementation of SARS CoV-2 laboratory testing - Zimbabwe country experience

Agenda

- **Background to Diagnostic Networks Optimization (DNO) in Zimbabwe**
- How DNO has helped in expanding SARS CoV-2 testing
- Waste Management
- Lessons Learnt

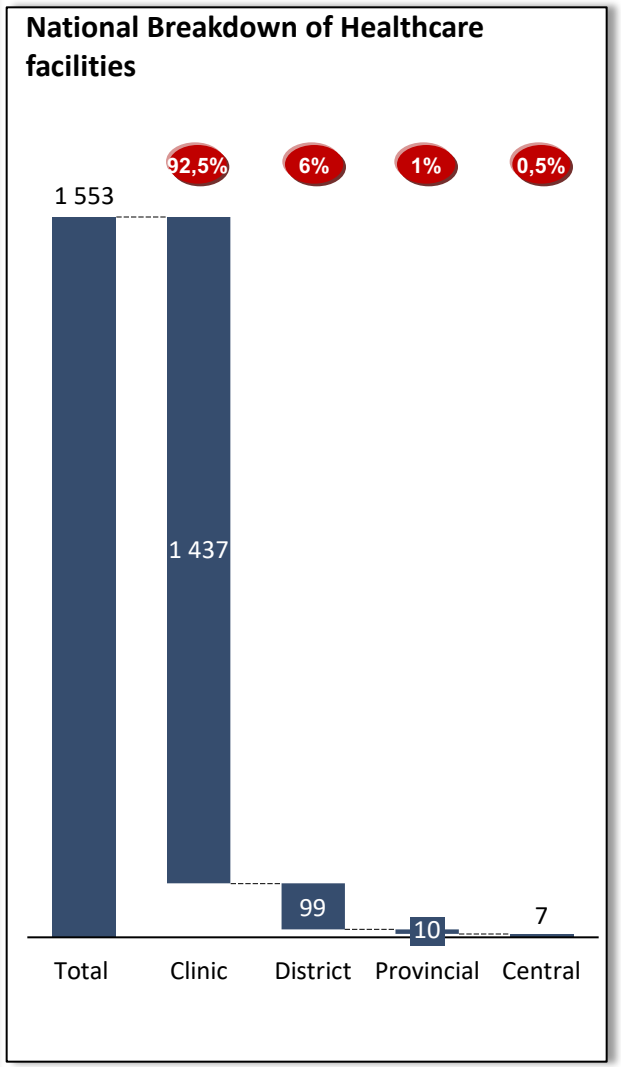
Zimbabwe has >1500 Health Facilities spread across the length and breadth of the country

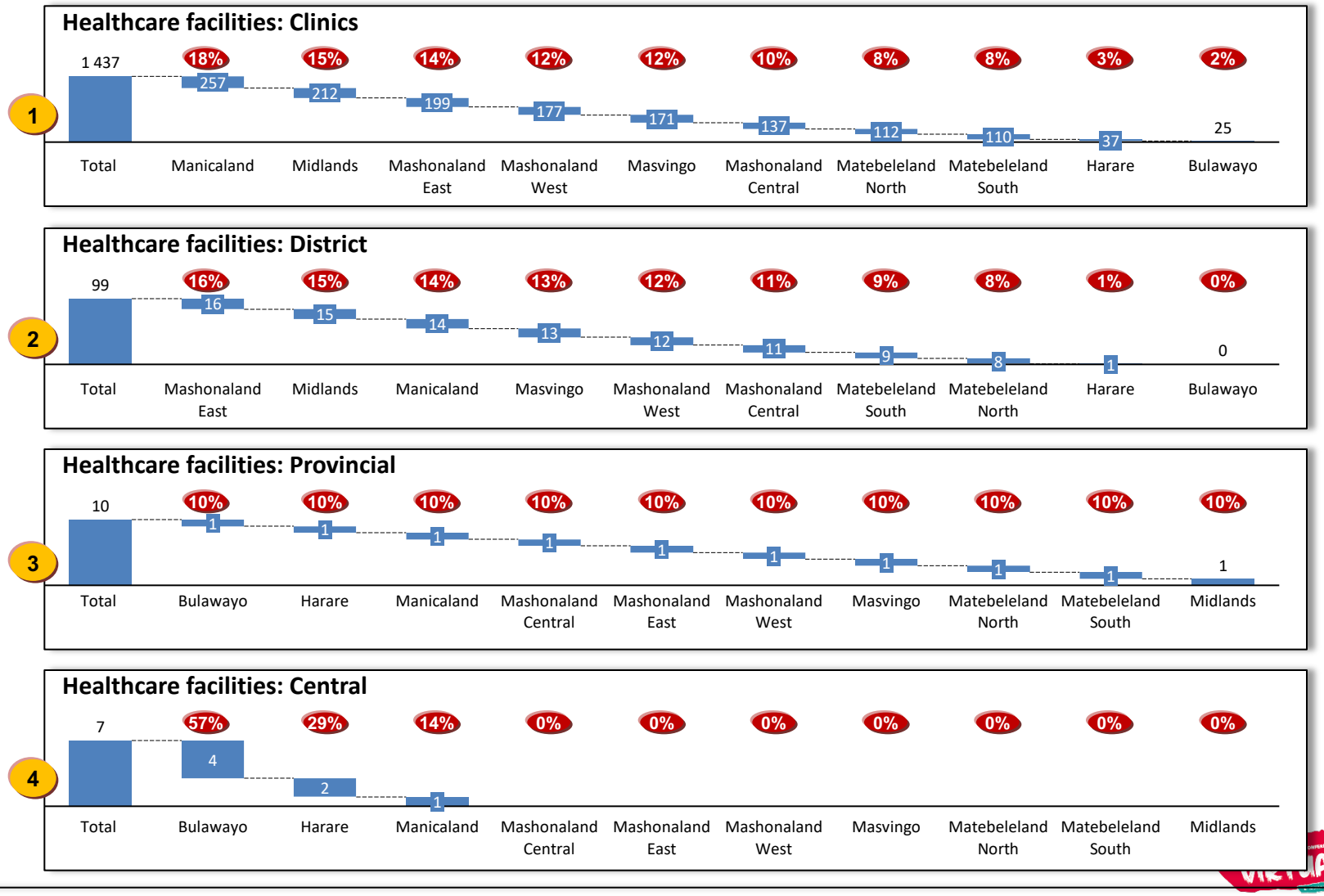


Source: Ministry of Health and Child Care (Zimbabwe)

Zimbabwe's Health Facilities fall under the 4 broad categories of "Clinics", "District", "Provincial" and "Central"

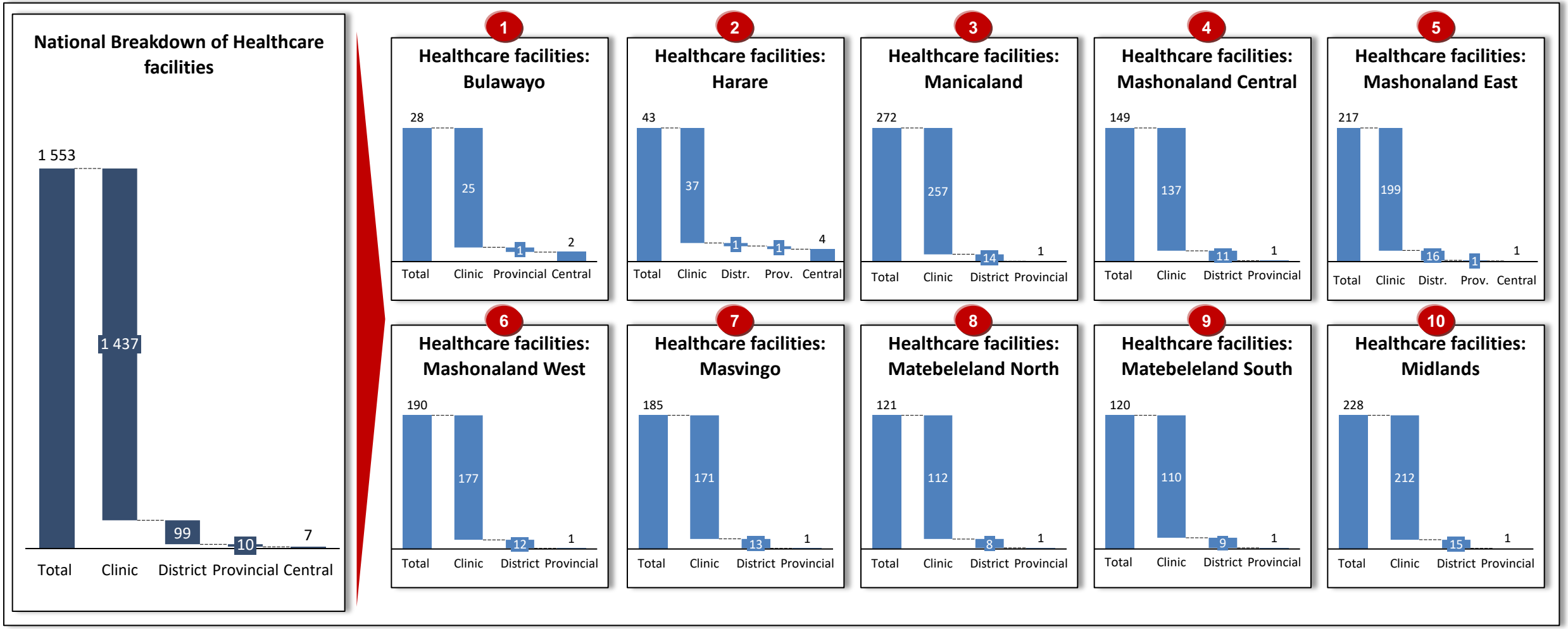
X% % of total number of health facilities





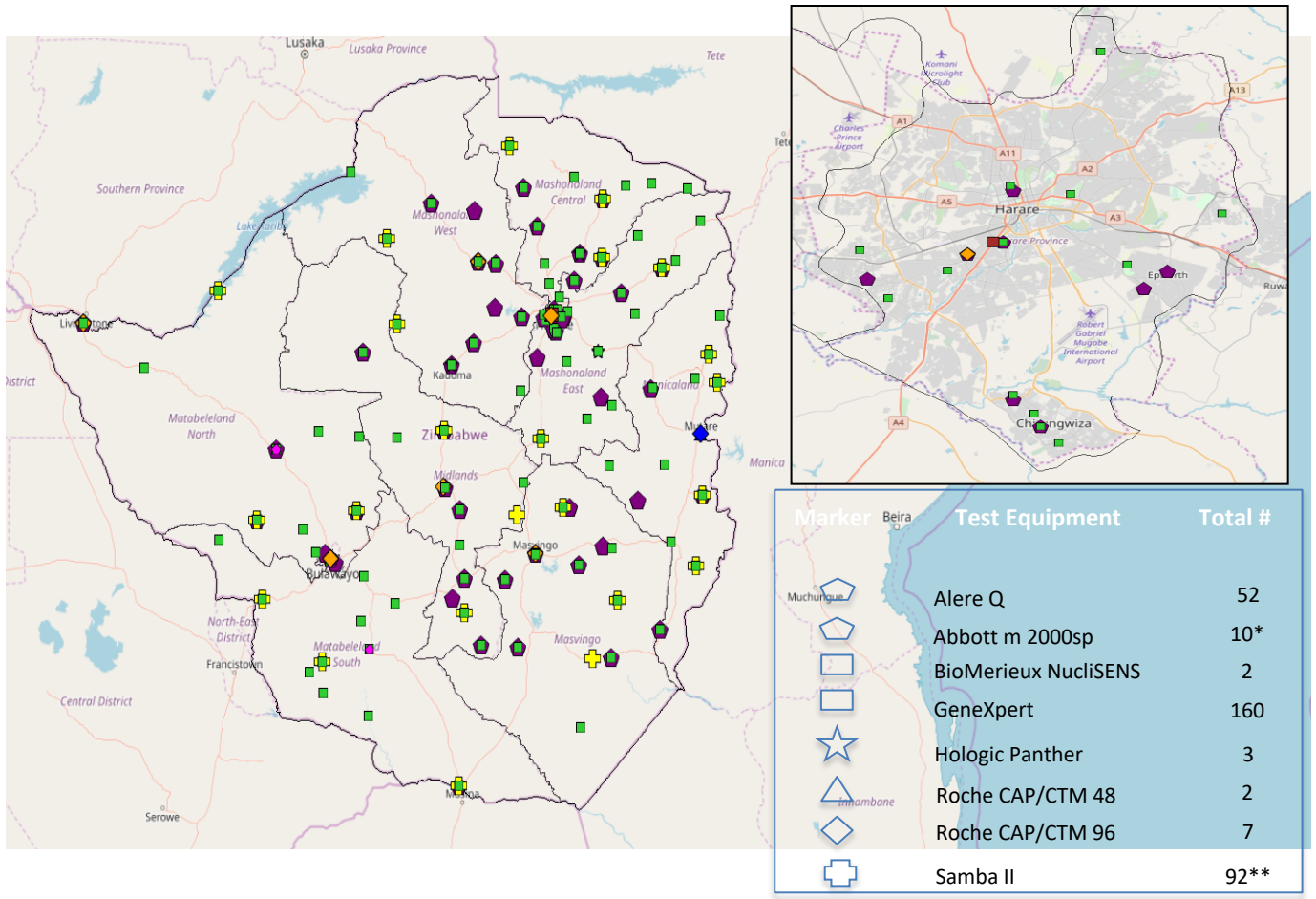
Source: Ministry of Health and Child Care (Zimbabwe)

Zimbabwe's Health Facilities are located in 10 provinces/cities

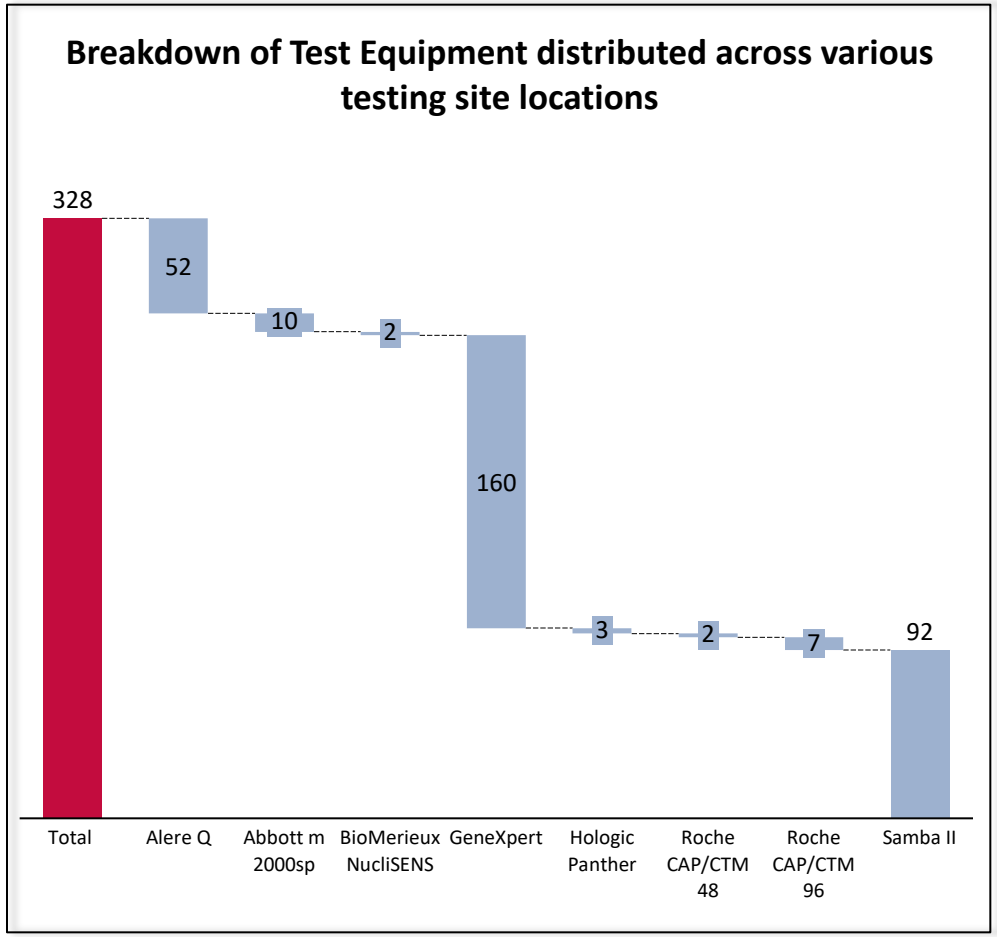


Source: Ministry of Health and Child Care (Zimbabwe)

ZIMBABWE has >300 testing site locations that utilise various test equipment



Marker	Test Equipment	Total #
	Alere Q	52
	Abbott m 2000sp	10*
	BioMerieux NucliSENS	2
	GeneXpert	160
	Hologic Panther	3
	Roche CAP/CTM 48	2
	Roche CAP/CTM 96	7
	Samba II	92**



***6 Abbott m2000sp Locations & 10 machines total**
**** 23 Samba II Locations & 4 machines at each site**

Source: Ministry of Health and Child Care (Zimbabwe)

Progress of DNO[1] work in Zimbabwe: Preliminary costing of IST[2] was performed, Provinces were established as “the most important testing centres” and MoHCC’s IST funding application was approved by UNDP

2018

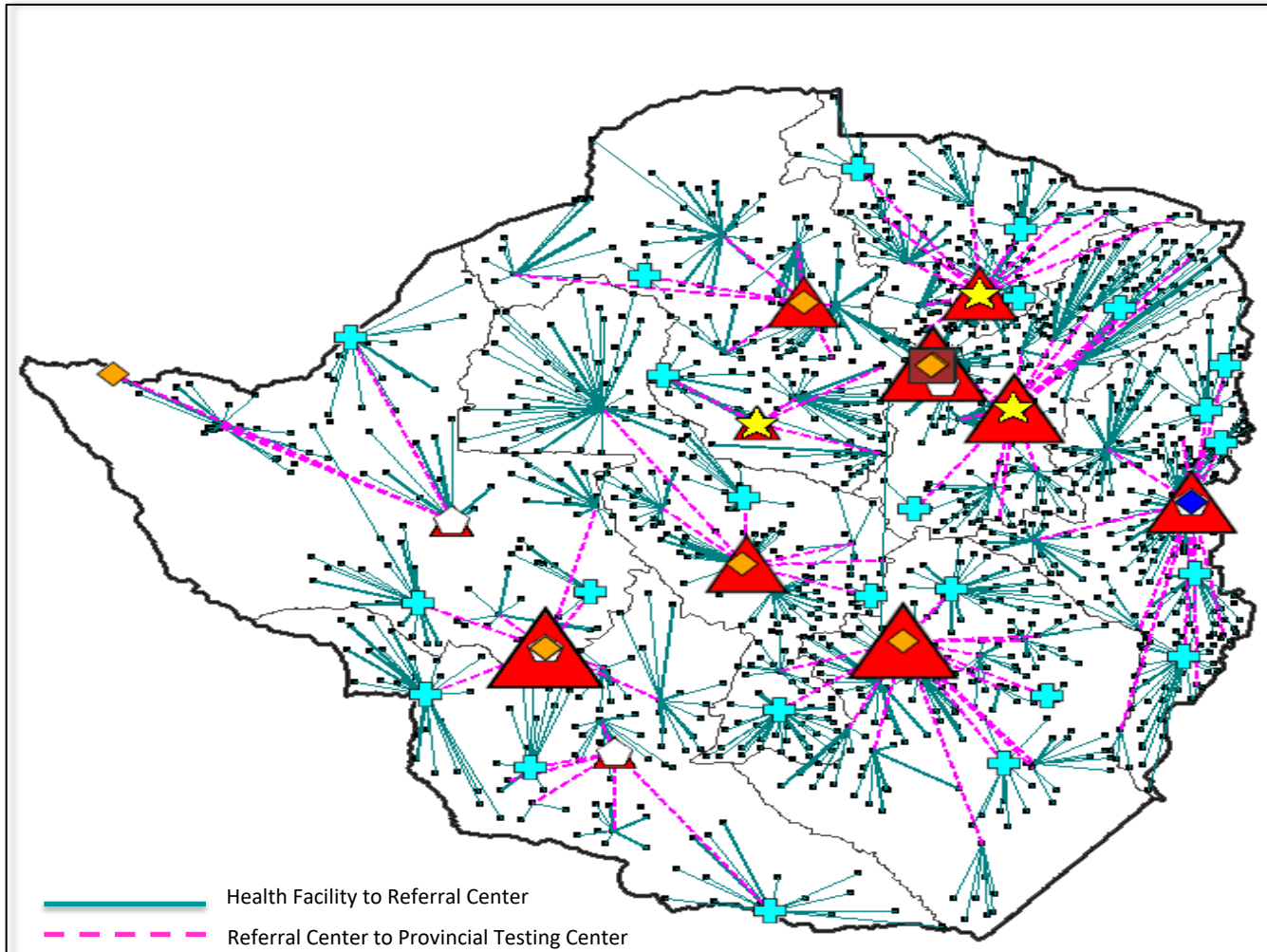
- First DNO meeting was held – it was attended by MoHCC and all key stakeholders
- Outcomes:
  - Preliminary costing of Integrated Sample Transportation (IST) was done
  - DNO established that the most important testing centre is the Province where samples will move from “Health Facility” to the “District Referral Centre”, and then to “Provincial Testing Lab”

2020

- MoHCC made an application to UNDP for IST funding.
- UNDP Funding application was approved and now awaits implementation

Source: Ministry of Health and Child Care (Zimbabwe) 1. DNO: Diagnostic Network Optimization 2. IST: Integrated Sample Transportation

Diagnostic Network Optimization (DNO) has resulted in decentralization of testing across the 10 provinces, which are in turn supported by District Referral Centres and Health Facilities[1]



Marker	Facility Type	Total #
	Provincial Hub	10
	*Scaled by VL Provincial Test Demand	
	Health Facilities	1553

Marker	Test Equipment	Total #
	Abbott m 2000sp	10*
	BioMerieux NucliSENS	2
	Hologic Panther	3
	Roche CAP/CTM 48	1
	Roche CAP/CTM 96	10
	Samba II	92**
	*4 Machines Per Site	

Source: Ministry of Health and Child Care (Zimbabwe)

1. Implementation of DNO decentralised testing model still needs to be fine tuned via equipment reallocation and sample transportation re-assignment

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Investments in Diagnostic Networks Optimisation (DNO) have expedited planning and implementation of SARS CoV-2 laboratory testing by focussing on 4 key elements

X Key element Reference number utilised as a marker in subsequent slides

Key Elements / Sources of Advantage arising from DNO that have positively impacted SARS COV-2 testing efforts

1. Decentralization of testing from one testing site to multiple centres
2. Pre-existing Lab-based and POC equipment distributed across Zimbabwe
3. Ongoing sample transportation system integration efforts
4. The Zimbabwe Laboratory Commodity Distribution System (ZILACODS) for commodity distribution

Source: Ministry of Health and Child Care (Zimbabwe)

1 The Diagnostic Networks Optimisation (DNO) programme championed decentralization of testing from one testing site to multiple centres, and has been instrumental in increasing Zimbabwe's capacity for SARS COV-2 testing

Current phase

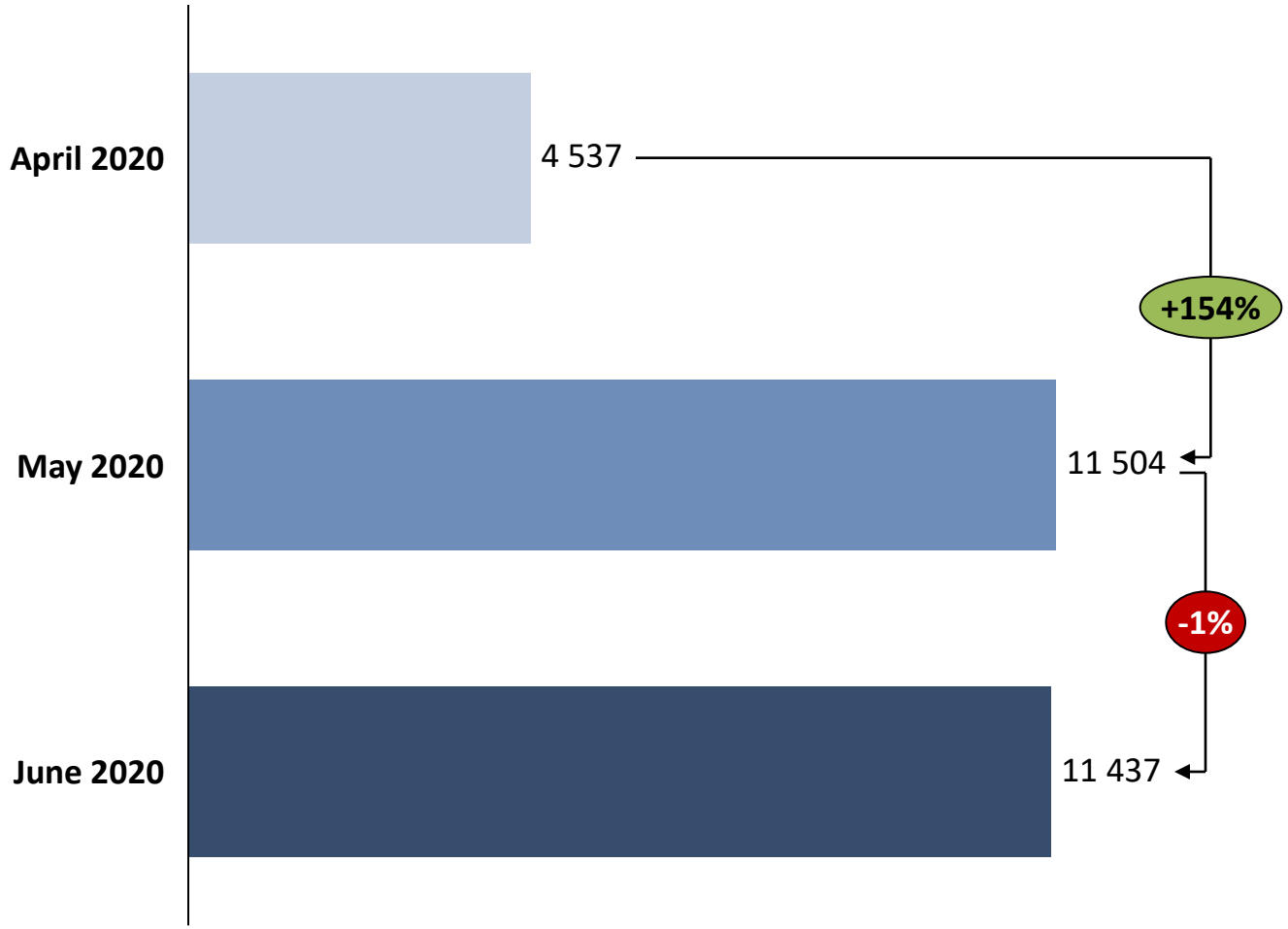
	1 Phase 1: Open Platform at NMRL	2 Phase 2: Open Platform Decentralisation	3 Phase 3: Decentralisation to Provincial Sites	4 Phase 4: Decentralisation to Hot spots and selected district centres
Description of Phase / Centre Selection criteria	▪ At this stage all testing was performed at a central location, namely the National Microbiology Reference Lab (NMRL) ▪ **Note:** Though now in Phase 4, NMRL continues to serve as main diagnostic national referral centre for processing of COVID-19 samples	▪ To assist in the response to COVID-19, **extended testing facilities/centres** were availed ▪ Centre selection was based on an ability to perform molecular diagnosis real-time **Reverse Transcription Polymerase Chain Reaction** (RT-PCR) with demonstrated quality and biosafety standards	▪ Additional laboratories were capacitated to support testing of COVID-19 samples ▪ Lab selection targeted Provincial hospitals with GeneXpert devices in place and University Biotechnology Laboratories	▪ Centre selection targeted areas with high volume of human traffic, for example: — borders offering passage to returnees from outside the country; — central hospitals; — prisons; — Military bases
Constraints/ Outcomes	▪ NMRL testing capacity was unable to handle increased testing demand after outbreak of COVID-19 ▪ Decentralisation to other labs became imperative in order to create additional testing capacity	▪ Open Platform Decentralisation effort was successful but was inadequate to meet increasing demand	▪ Decentralisation to provincial sites assisted in addressing the testing capacity gap, but was still insufficient to meet increased demand arising from the spread of COVID-19	▪ Increased Sample testing capacity has assisted in addressing SARS COV-2 testing requirements ▪ Additional centre selection is ongoing to further increase Phase 4 capacity
Labs/ Locations added to decentralised testing programmes	▪ NMRL	▪ NVL, Mpilo, AIBst and BRTI	▪ Masvingo, Gweru (Midlands), Mat North, Mat South, Mash West, Mash East, Mash Central, Manicaland, Harare, Bulawayo	▪ Beitbridge, Plumtree, Chikurubi, Khami, Hwange, VicFalls, Kadoma, Parirenyatwa, Chipinge, Josiah Magama Tongogoara KJ6, Chipinge, NTBRL, UBH, Thorngroove

Source: Ministry of Health and Child Care (Zimbabwe)

1

Decentralisation of testing has played a key role in increasing the number of SARS COV-2 tests per month in Zimbabwe

Total Number of SARS COV-2 tests done per month (April-June 2020)



- Increase in number of SARS COV-2 tests was driven by decentralisation efforts to clear backlog at NMRL

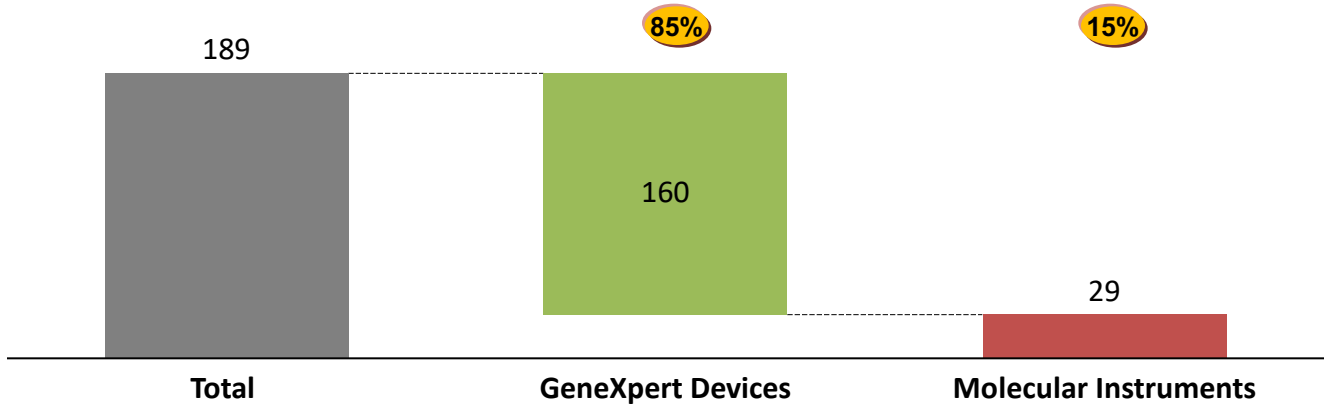
- Tests for June 2020 remained high but dipped slightly due to commodity availability challenges, e.g. reagents

Source: Ministry of Health and Child Care (Zimbabwe)

2 Pre-existing lab-based and POC equipment distributed across Zimbabwe provides opportunities for SARS Cov-2 testing across the country

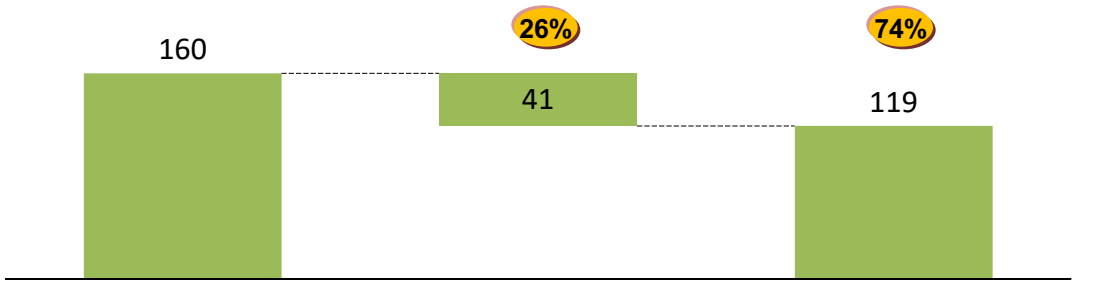
X% % of total number of devices/instruments

Total Testing Landscape: Lab-Based and POC Equipment in Zimbabwe



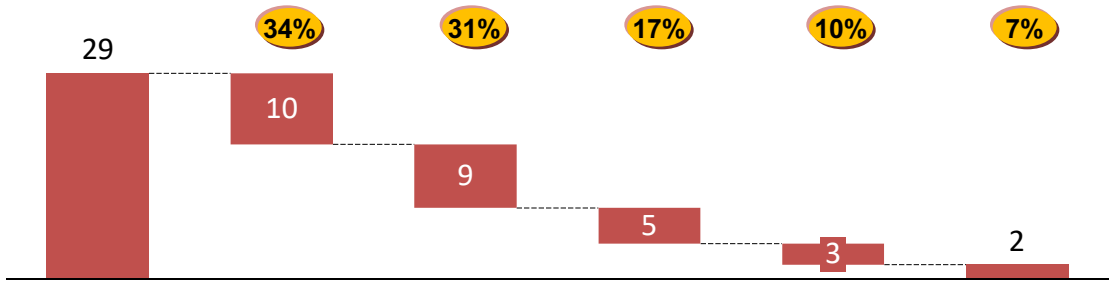
1

GeneXpert Devices



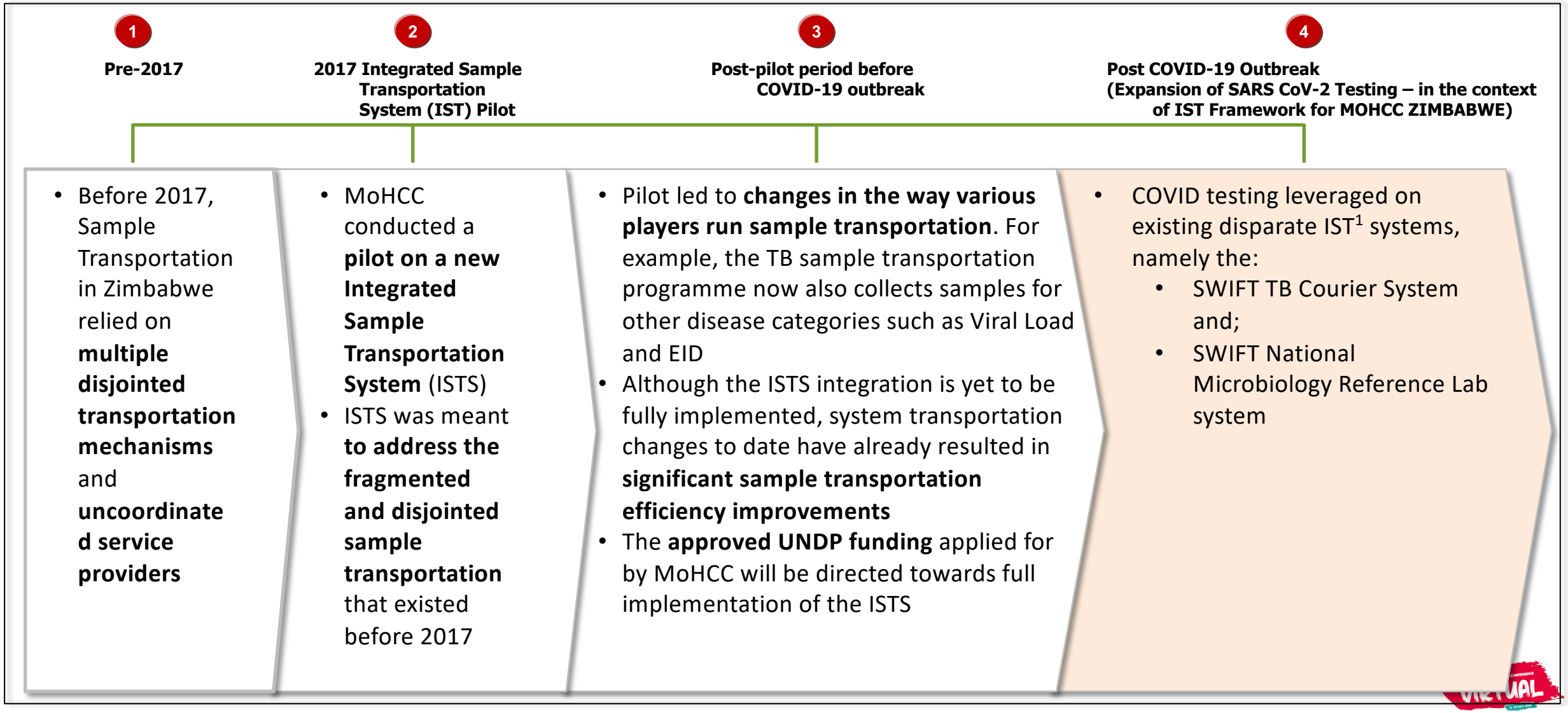
2

Molecular Instruments



Source: Ministry of Health and Child Care (Zimbabwe)

3 To address fragmented and disjointed sample transportation in Zimbabwe, MoHCC initiated a sample transportation system integration programme in 2017 that has now been leveraged for SARS COV-2 testing



Source: Ministry of Health and Child Care (Zimbabwe)

1. IST: Integrated Sample Transportation

4 The Zimbabwe Laboratory Commodity Distribution System (ZILACODS) already existed and was leveraged on for SARS-CoV2 commodity distribution

1 What is ZILACODS?	2 What have the benefits of ZILACODS been to date?	3 MoHCC has leveraged the pre-existing ZILACODS system to expedite SARS CoV-2 commodity distribution
• It is a system used by MoHCC for distribution of laboratory commodities across Zimbabwe	• Since its introduction, ZILACODS has greatly reduced product stock-outs and downtime while improving service delivery in the country	• SARS-CoV2 Testing was urgent given the nature and scale of the COVID-19 pandemic • Recreating a new commodity distribution system to cater for COVID-19 commodity movement would have been time consuming and inefficient • MoHCC decided to leverage the existing system, namely ZILACOD to speed up movement of COVID19 commodities across the country • Use of ZILACOD has significantly expedited SARS COV2 commodity distribution

Source: Ministry of Health and Child Care (Zimbabwe)

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- **Waste Management**
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Waste Management is a critical element in sample handling and remains a challenge, however, MoHCC is taking active steps to resolve it

	Current Situation	Challenge	Proposed Solutions
1 **Guanidinium Thiocyanate (GTC)**	• Guanidinium Thiocyanate (GTC) is produced by SARS COV-2 testing at GeneXpert sites	• GTC is a toxic compound that is harmful to human and aquatic life	• Recommended disposal of GTC is high temperature incineration at a minimum of 1000 °C
2 **Liquid Waste**	• Liquid waste is currently not being disposed	• Zimbabwe made a bold decision in 2019 to halt disposing liquid waste in sewer drainage. Consequently, liquid waste is currently accumulating in storage, pending implementation of an effective solution	• MOHCC is currently in communication with cement manufacturers and mining companies for them to assist with incineration of liquid waste
3 **Xpert cartridges**	• All Xpert Cartridges need to be carefully disposed of once utilised • For HIV VL/EID/SARS CoV- 2: cartridges are collected by MoHCC and transported to a private incinerator	• Current processes are not adequate to ensure timely disposal of all cartridges once these are utilised	• To augment current efforts, MOHCC is currently in communication with cement manufacturers and mining companies for them to assist with incineration of Xpert cartridges

Source: Ministry of Health and Child Care (Zimbabwe)

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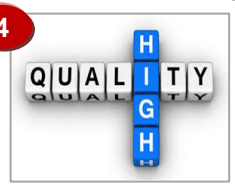
Lessons Learned

	Lesson	Description
1 	**Coordination and confidence**	• Coordination and confidence in sample transportation with minimal loss
2 	**Operational Efficiencies**	• Route planning and dedicated system deliver much-needed operational efficiencies
3 	**Cost optimisation from integration**	• The cost of transporting samples in an integrated way is greatly reduced compared to parallel uncoordinated systems (Case of TB challenge and APHL)
4 	**Integrity and Quality of Samples maintained**	• Samples spend minimal time between collection and testing hence increased surety on quality of results
5 	**Well established results relay due to observing timeliness**	• Results will always be put to good use as they will be returned to their respective destinations

Source: Ministry of Health and Child Care (Zimbabwe)