

INTEGRATED SAMPLE TRANSPORTATION AND OPTIMISATION IN ZIMBABWE: THE LESSONS

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Outline

- Integrated Sample Transportation
- Optimization
- Integration of Testing

Background

- MOHCC has approximately 1,600 health facilities
- Well established Health Referral system
- Rural Health Centre – District/Mission-Province – Central/Tertiary levels
- Sample Transport: Ambulances, Courier, EHTs

Sample Transportation Activities

- Increase in sample volumes and types being transported
- VL, EID, FBC, Chemistry, Sputum etc
- **Fragmented transportation** including patient referral, patients carrying their own samples, EHTs, courier service, partner-initiated models
- **Overall principle** = Undocumented **Hub & Spoke Model** in operation in both funded and unfunded districts in the country
- PARALLEL uncoordinated systems through partners and some districts have no support at all

Equipment Placement

- Equipment (VL, CD4, EID etc) currently placed by geographical and political guidance, i.e. as long as there is a hospital with a lab infrastructure and HR, an institution qualifies to get a machine
- Usually size of the hospital guides the size of the machine, i.e. District, Provincial, Central.
- Assumption is the bigger the hospital, the higher the workload

Mitigation Plan

- **Integrated Sample Transportation (IST)**
- **Concept:** All samples needing testing should move in a **coordinated, efficient and sustainable way, observing integrity and quality.** Results should equally and accurately find their way back to the clients in a timely manner
- Optimise the placement of equipment through various factors including demand and move the equipment according to the optimization plan

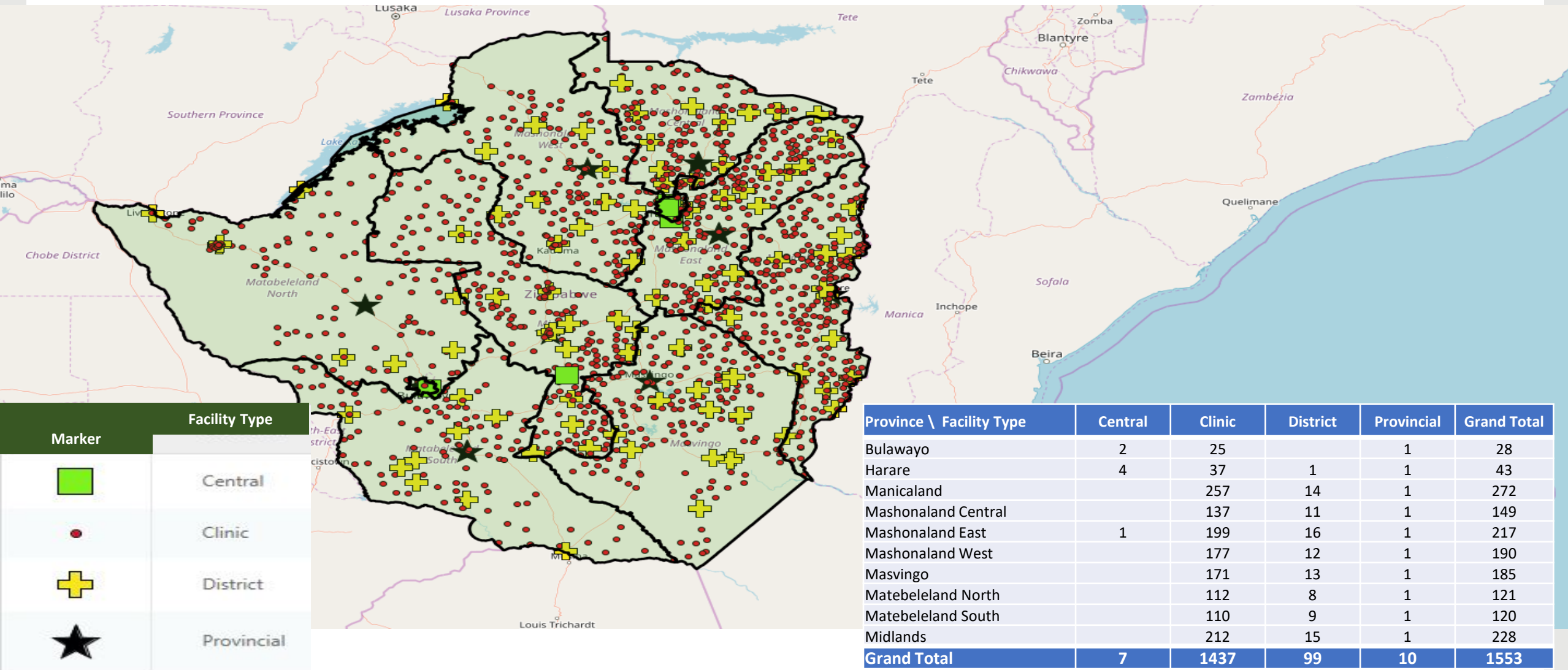
Approach

- Hub & Spoke Model adopted in principle
- Use of the Lab Equip software for Optimisation and IST modelling
- GPS coordinates for all Health Facilities availed for referral mapping
- Engagement of ALL stakeholders to craft a sustainable IST framework

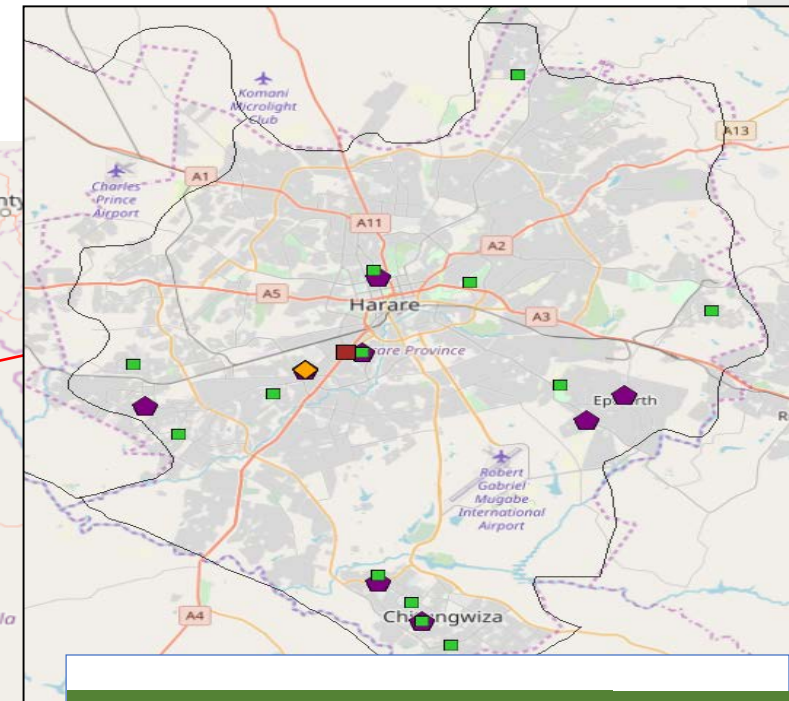
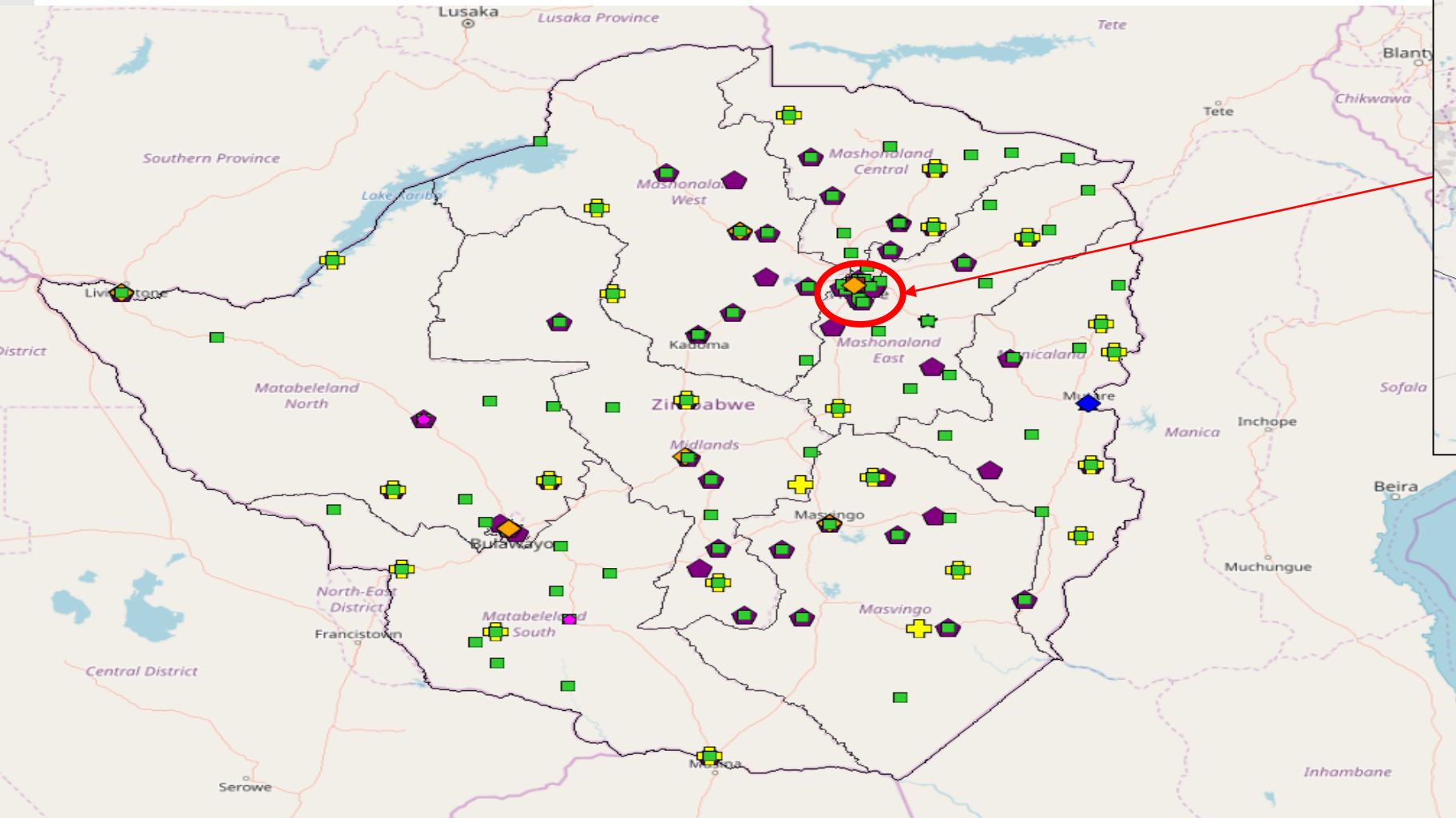
OUTCOME

ONE IST Framework for MOHCC ZIMBABWE in an Optimised environment

Zimbabwe: All Health Facilities



Zimbabwe: Testing Site Locations

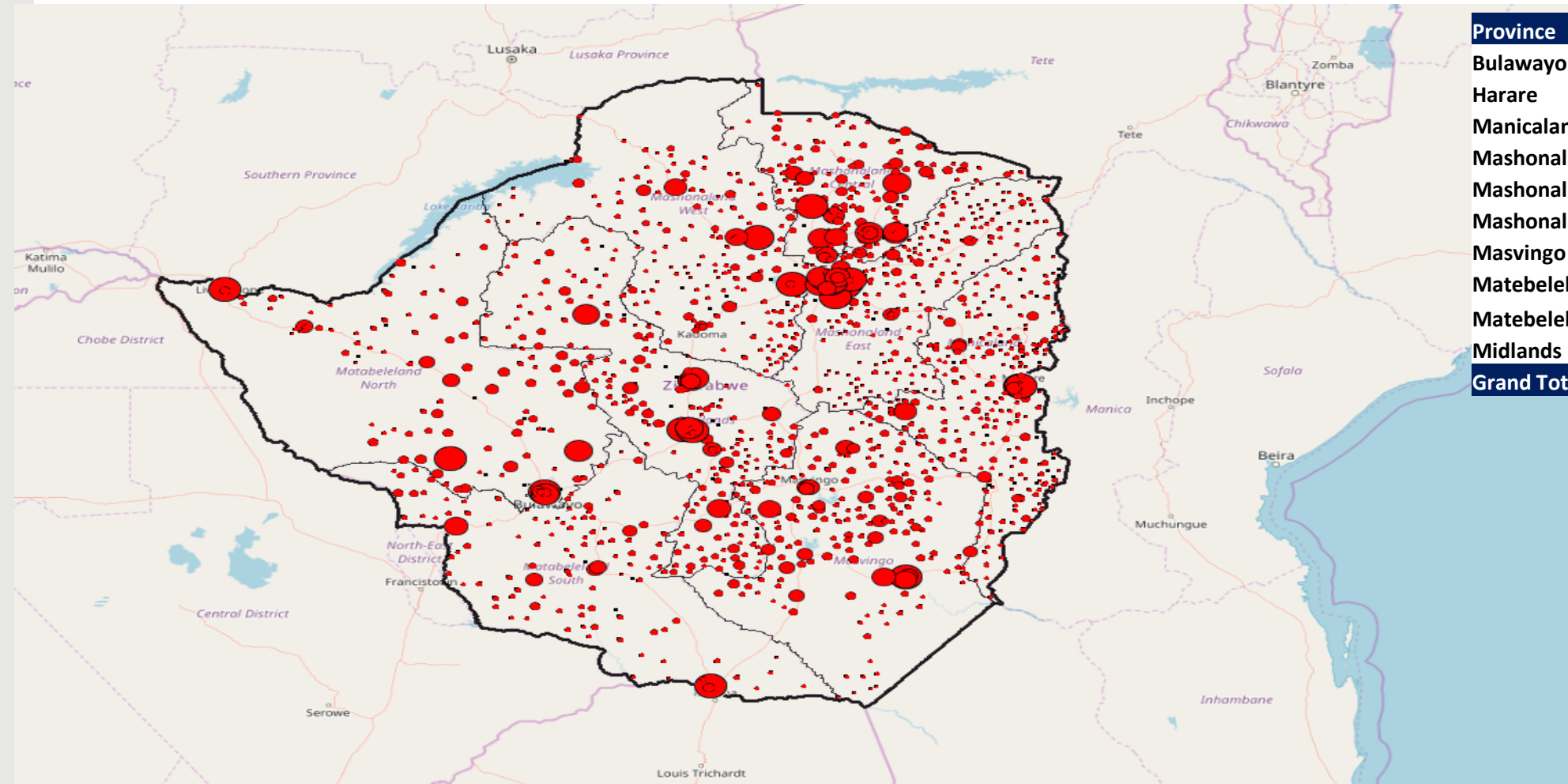


Marker	Test Equipment	Total #
	Alere Q	52
	Abbott m 2000sp	10*
	BioMerieux NucliSENS	2
	GeneXpert	120
	Hologic Panther	3
	Roche CAP/CTM 48	2
	Roche CAP/CTM 96	7
	Samba II	92**

*6 Abbott m2000sp Locations & 10 machines total

** 23 Samba II Locations & 4 machines at each site

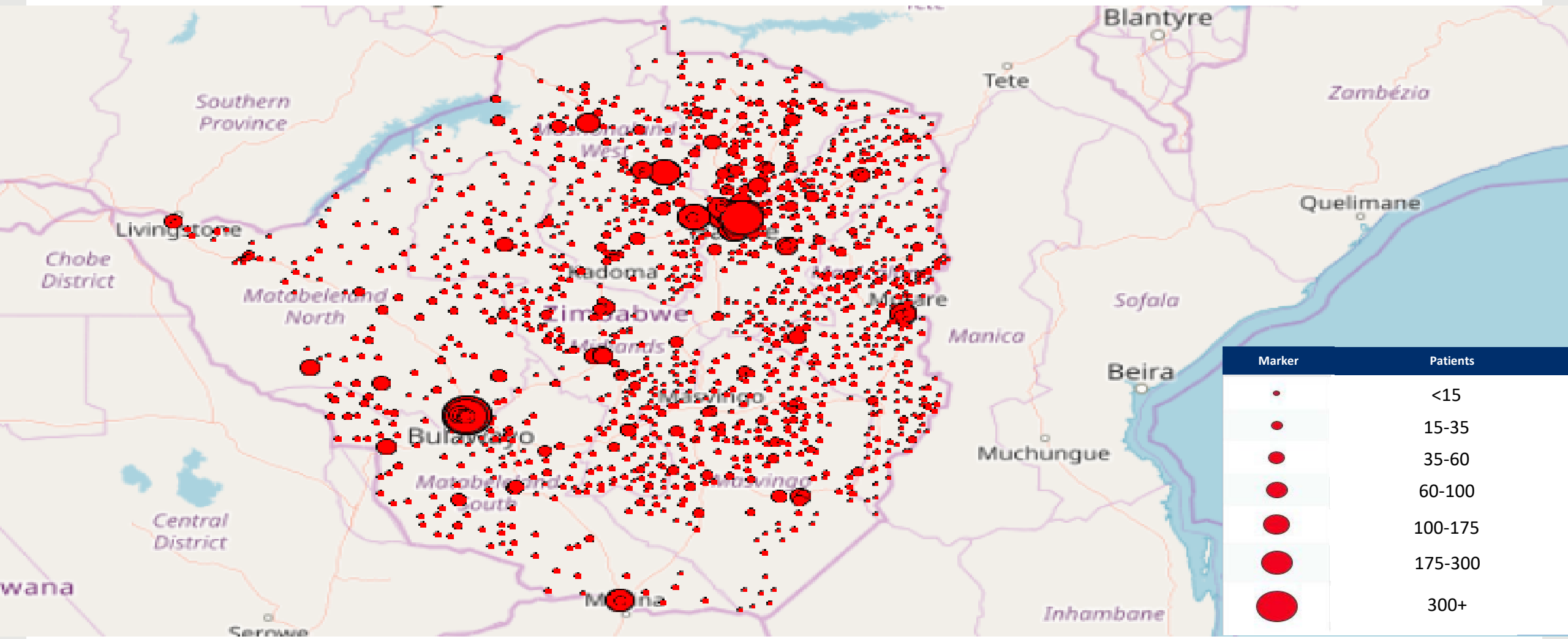
HIV Patient Distribution



Province	Total HIV Patients
Bulawayo	79,517
Harare	127,337
Manicaland	117,954
Mashonaland Central	87,148
Mashonaland East	150,747
Mashonaland West	138,038
Masvingo	113,856
Matabeleland North	67,402
Matabeleland South	85,873
Midlands	132,087
Grand Total	1,099,959



Marker	Patients
	<2,000
	2-4k
	4-6k
	6-8k
	8-10k
	10-12k
	12k+







Pregnant Women Distribution (EID)

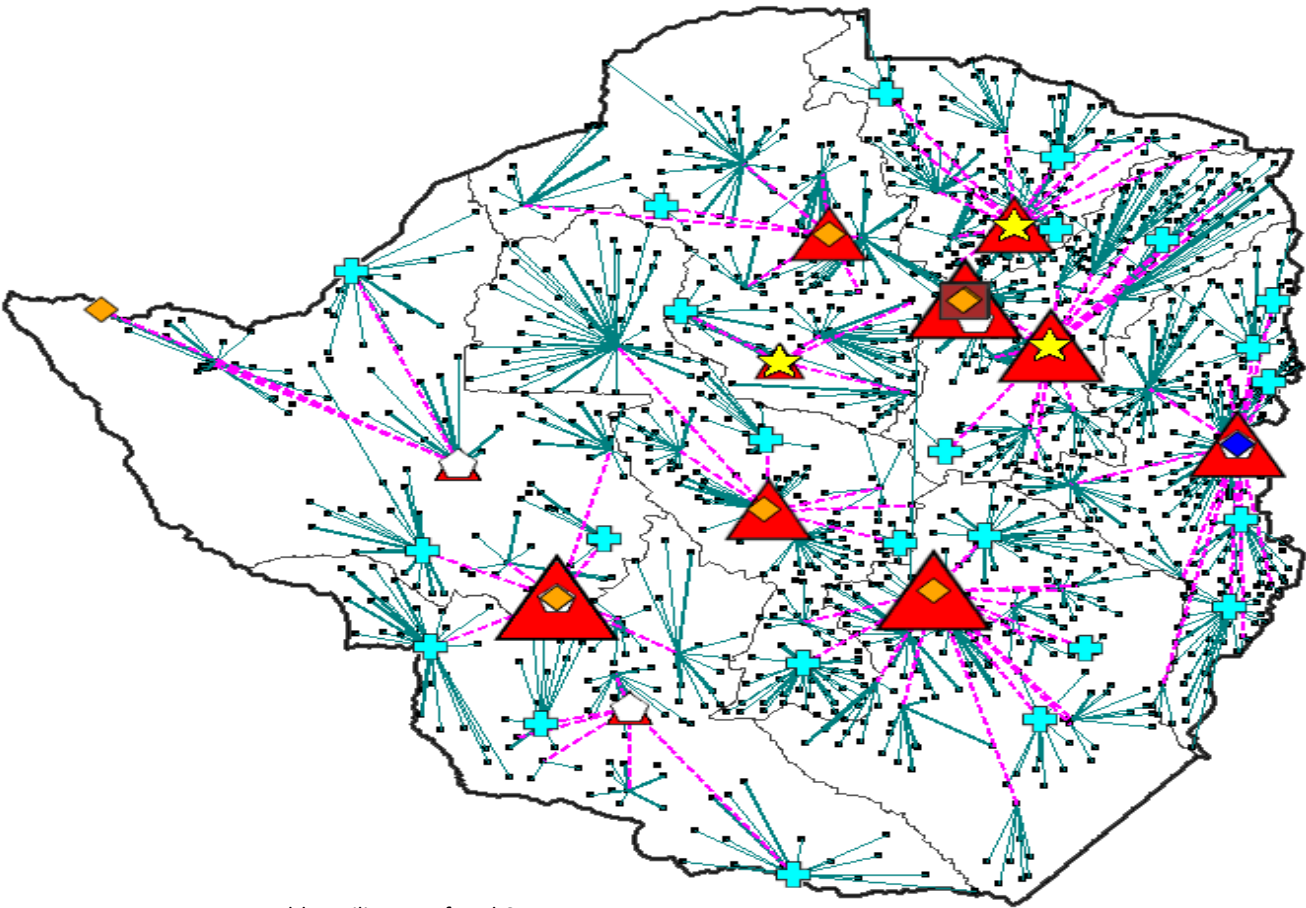




Viral Load Network

Provincial Location	VL Demand
Bulawayo	156,795
Harare	142,903
Manicaland	116,226
Mashonaland Central	95,334
Mashonaland East	128,723
Mashonaland West	138,038
Masvingo	143,005
Matebeleland North	30,771
Matebeleland South	45,226
Midlands	102,938

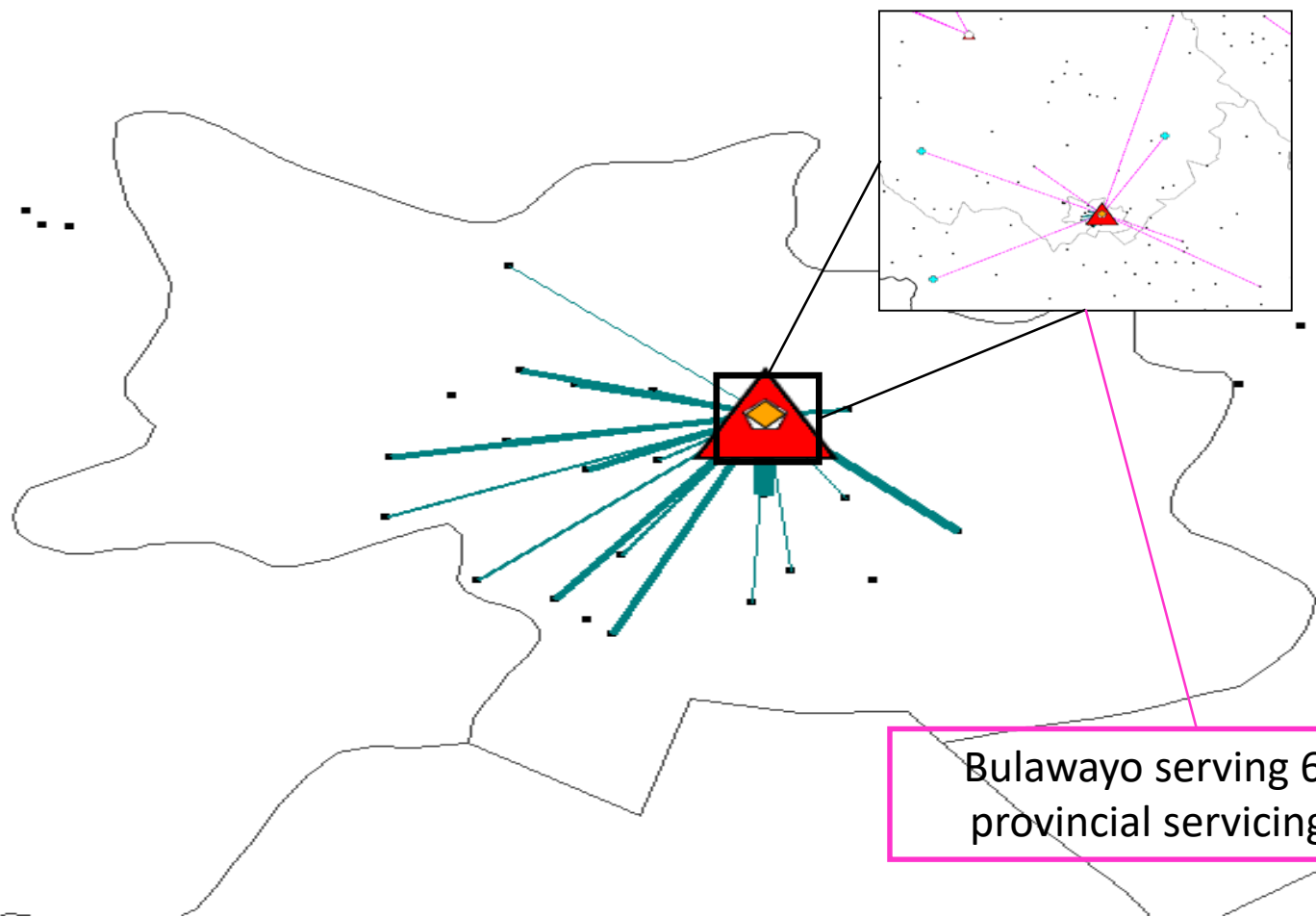
Marker	Facility Type	Total #
	Provincial Hub	10
<i>*Scaled by VL Provincial Test Demand</i>		
	Health Facilities	1553

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		



 Health Facility to Referral Center
 Referral Center to Provincial Testing Center

Viral Load Network - Bulawayo



Equipment	Capacity
Abbott m2000sp	49,104
Roche CAP/CTM 96	155,232
Total Equipment Capacity	204,336
Total VL Tests Required	156,795
Surplus	47,541

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

Marker	Test Equipment	Total #
	Abbott m 2000sp	2
	BioMerieux NucliSENS	0
	Hologic Panther	0
	Roche CAP/CTM 48	0
	Roche CAP/CTM 96	4
	Samba II	0
*4 Machines Per Site		

Viral Load Network

Harare

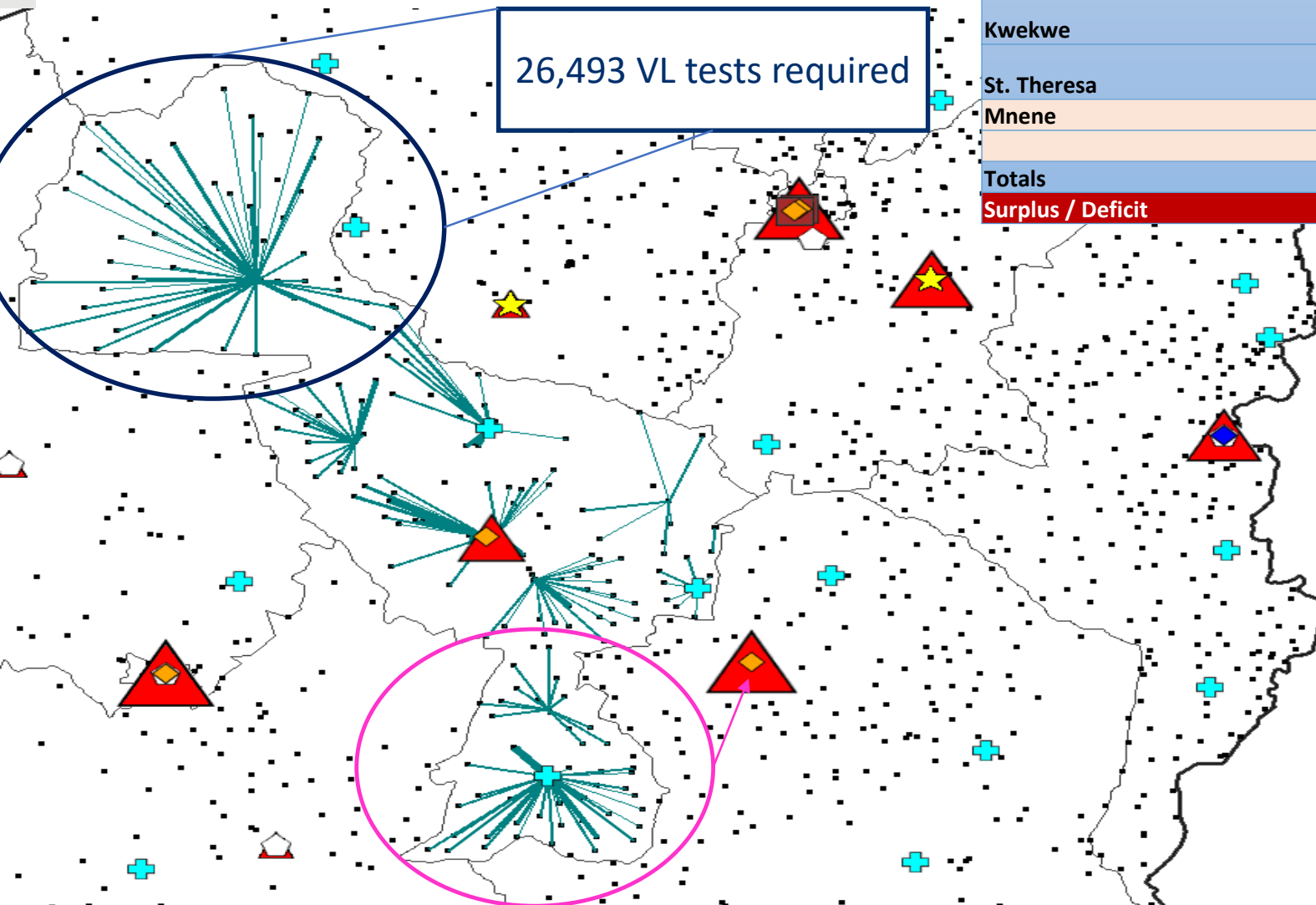
Site	Primary Equip	# Machines	Test Cap/Year	VL Tests
Beatrice Infectious	Biomerieux NucliSENS	1	76032	142,903
Beatrice Infectious	Roche CAP/CTM 96	1	38808	
National Microbiology Reference Laboratory	Abbott m2000sp	3	73656	
National Microbiology Reference Laboratory	Biomerieux NucliSENS	1	76032	
Totals			264,528	142,903
Surplus / Deficit				121,625



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

Marker	Test Equipment	Total #
	Abbott m 2000sp	3
	BioMerieux NucliSENS	2
	Hologic Panther	0
	Roche CAP/CTM 48	0
	Roche CAP/CTM 96	1
	Samba II	0
*4 Machines Per Site		

Viral Load Network – Midlands



26,493 VL tests required

Site	Primary Equip	# of Machines	Test Cap/Year	# VL Tests
Gweru District Hospital	Roche CAP/CTM 96	1	38808	79,292
Kwekwe	Samba II	4	3168	20,645
St. Theresa	Samba II	4	3168	3,001
Mnene	Samba II	4	3168	16,835
* Sending testing to Bulawayo Province				
Totals			48,312	102,938
Surplus / Deficit			(54,626)	

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

Marker	Test Equipment	Total #
	Abbott m 2000sp	0
	BioMerieux NucliSENS	0
	Hologic Panther	0
	Roche CAP/CTM 48	0
	Roche CAP/CTM 96	1
	Samba II	3
*4 Machines Per Site		

ZIMBABWE PROGRESS UPDATE

ACTIVITY	PROGRESS CHECK
IST Costing and Gap analysis	Comprehensive Costed Plan indicating both SET-UP and OPERATIONAL COSTS
Development of IST tools, SOPs and Operational Guidelines	Done
Development of Operational Framework	Done and activities are on course. Full Operations set to commence in January 2020
Mobilisation of Resources to Support IST	Done and managed to secure SET-UP funding from the Global Fund. Currently procurement of Capital IST equipment including motorbikes taking place
Current Operations	PEPFAR currently operating in 40/73 districts and implementing using the MOHCC adopted principle (Hub & Spoke)
Equipment Optimisation Plan	Assessment and Political engagement of Policy and Hospital management to initiate equipment movement

LESSONS LEARNT: IST

- **Coordination and confidence** in sample transportation with minimal loss
- **Operational Efficiencies:** Route planning and dedicated system brings the much-needed efficiencies
- **Cost sustainability 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)
- **Integrity and Quality of Samples maintained:** Samples spend minimal time between collection and testing hence surety on quality of results
- **Well established results relay observing timeliness:** Results will always be put to good use as they will be returned to their respective destinations

LESSONS LEARNT: OPTIMISATION

- **Optimal Utilization of Equipment:** Equipment is placed where it can best be used hence no unused capacity lying idle
- **Results Turn Around Time (TAT):** Results TAT improves with Optimization as equipment is moved nearer to the population needing the services
- **Running Cost Sustainability:** The operational costs of equipment becomes sustainable as these machines tend to have adequate sample volumes compared to the running costs
- **Human Resources Management:** Despite all these advantages realized through optimization, the facilities need to be adequately resourced in terms of HR to operate these machines



*Key Findings from integration of
HIV EID, VL, and TB testing
services in Zimbabwe*

Sept 2019

Xpert Evaluation and Feasibility studies

- MoHCC completed a laboratory evaluation for the GeneXpert for EID and VL by end of 2016
- Sensitivity and specificity for EID and VL(around 1000c/ml) was 99.4 and 98.3 respectively
- Will EID and VL testing crowd out TB testing upon integration?
- HIV TB program Impasse: Connectivity Data on utilization!!
- In 2017, MOHCC conducted a pilot across 8 facilities to determine feasibility and clinical Impact of HIV/TB integration
- EID testing: all HEI who needed NAT as per Algorithm
- VL: Targeted approach(pregnant and breastfeeding women, children/adolescents and individuals suspected of treatment failure)

Feasibility study Results

- Offering EID and targeted VL testing on existing Xpert devices decreases time to result availability compared to centralized lab-based testing, without impacting TB testing or treatment
- Same day result return to caregiver / ART initiation may not be feasible when using Xpert for EID testing unless the clinical system is modified to respond to a same day result.
- For patients with elevated VL, on-site VL testing on Xpert decreases time to clinical action, either EAC or drug switch, and increases the proportion of patients with a documented action, compared to centralized lab-based testing

Opportunities in Zimbabwe: Testing Landscape POC

- Currently of the 130 devices, 41 are multiplexing TB, HIV and EID.
- 1% of all VL testing in Zimbabwe has been ear marked for GeneXpert multiplexing through the national quantification exercise as a starting point in rolling out, while the geneXpert and mPima share 25% of all EID tests.
- HPV GeneXpert – Evaluation is underway for the GeneXpert to multiplex HPV.
- The country has 57 mPima platforms: plans are already underway to evaluate the mPima for VL for multiplexing
- Hologic: The country currently does not have HPV NAT testing capabilities except through multiplexing. The hologic presents an opportunity for HPV multiplexing. A pilot is underway to utilize the existing capacity within the 3 Hologic platforms in country for introducing NAT Cervical cancer screening



THANK YOU