Processes and Systems to Understand the Laboratory Network through GIS Mapping

AGNES JURU-ZIMBABWE

Background

- Lab mapping is the process of establishing Geo-Location and capacity of all laboratories in a country.
- Zimbabwe conducted the lab mapping exercise in January 2023 as one of its practical assignments of the LabNet Lead Course.
- Selected public and private laboratories were mapped during this exercise, where for the public facilities, the priority was to mop up facilities which had not been mapped before.

Benefits of Lab Mapping

It helps in identifying strengths and weaknesses of the diagnostic system.

It shows distribution of laboratories across the country

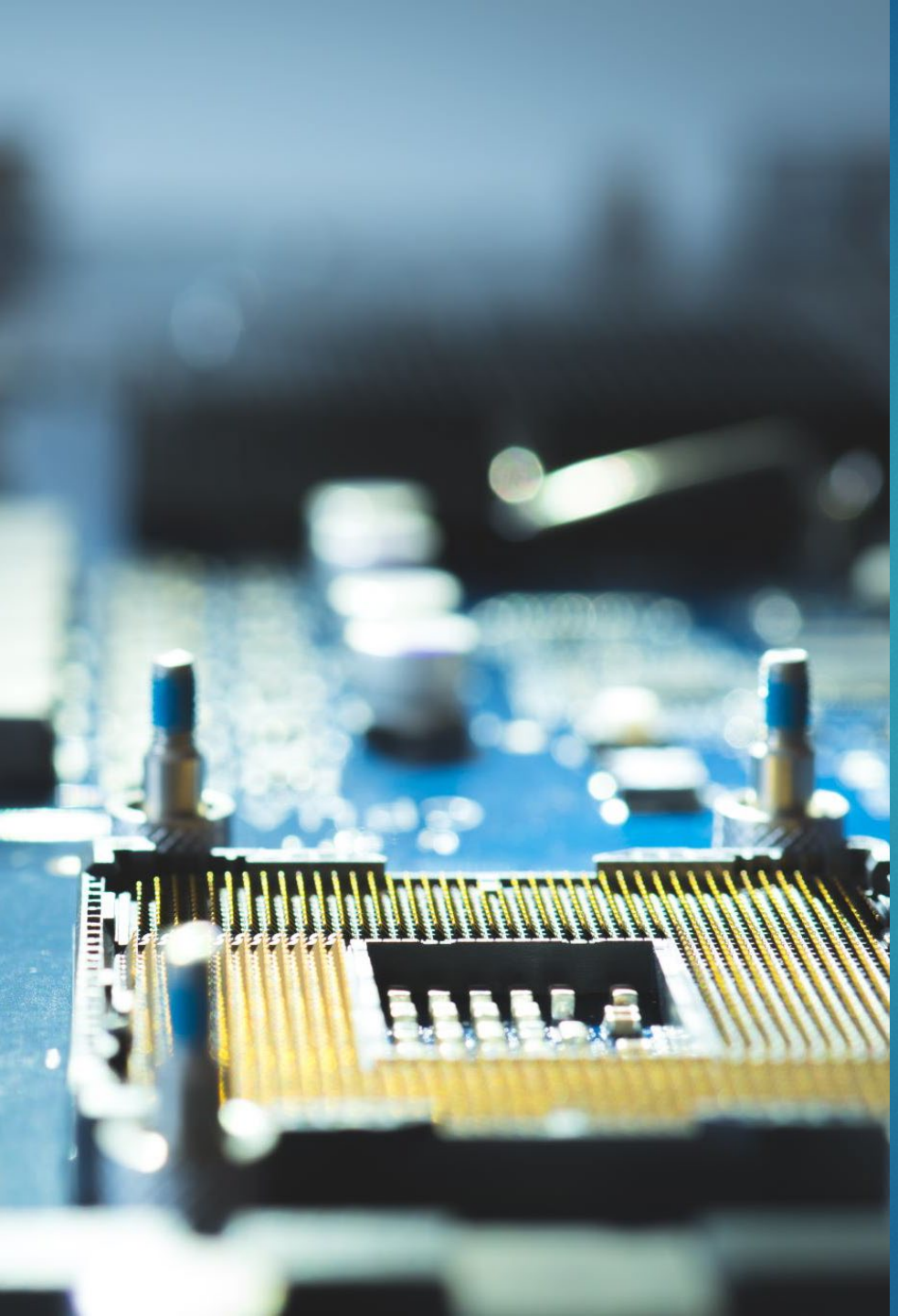
It improves functionality of national and regional laboratory networks by mutualising existing resources.

Helps increase diagnostic testing capacity and surveillance coverage of laboratory networks

Assists in preparing for and respond to disease outbreaks.

Scope

- National scope
- Both public and private laboratories
- 5 teams of 3 – 4 officers
- Provincial approach with each team servicing 1 – 2 provinces
- 2-day training followed by 10-day field mapping exercise



The Lab Mapping Tool

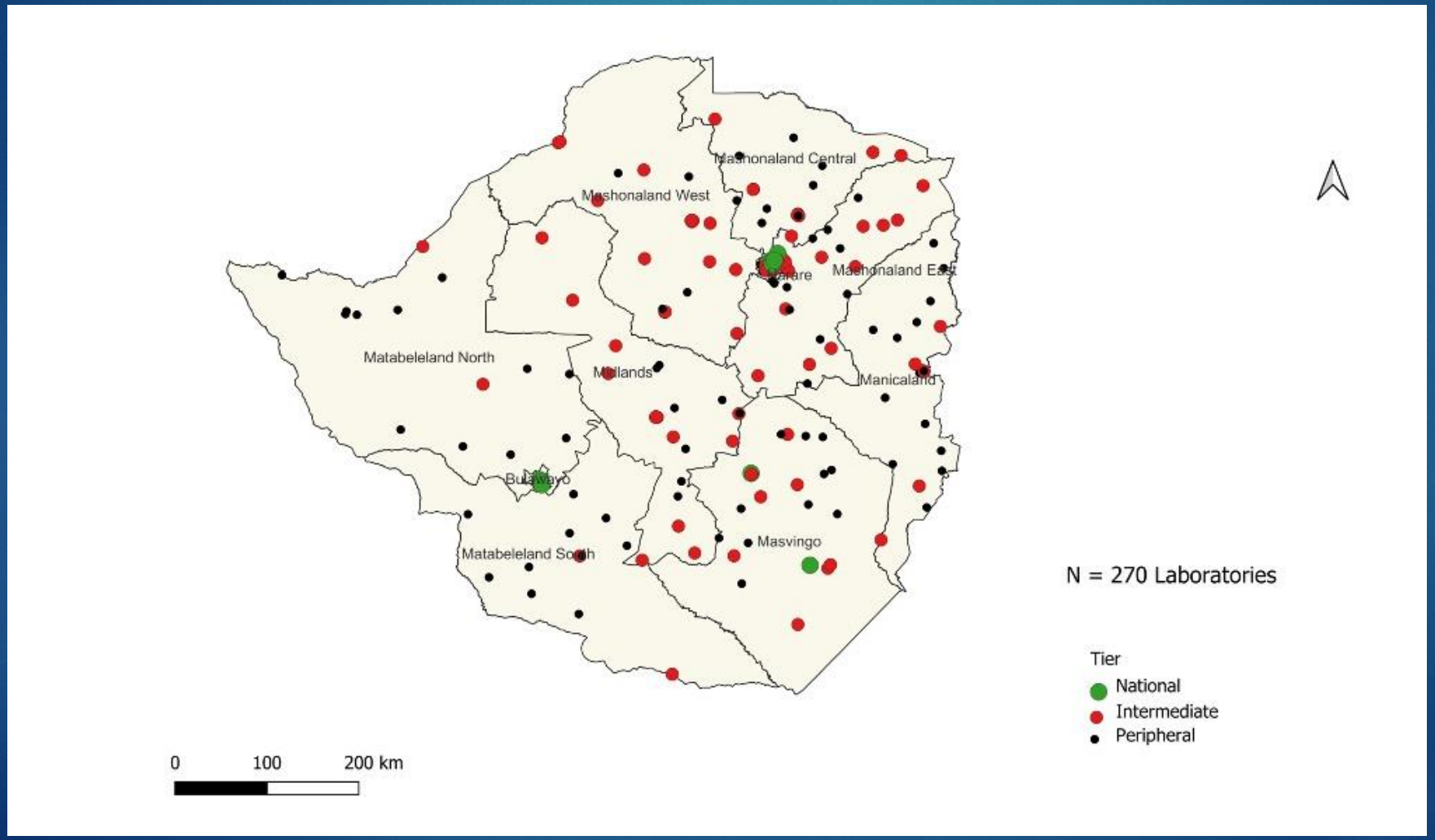
An Open Data Kit (ODK) mapping tool was used and it assessed the following areas:

- Laboratory Profiling
- Infrastructure
- Test Menu
- Quality Management System (QMS) activities
- Laboratory Information Management Systems (LIMS)
- Biosafety & Biosecurity
- Supply Chain Management Systems (SCMS)

Mapping Outcomes

- A total of 270 labs were mapped including national, intermediate and peripheral labs (see map)
- Data cleaning still pending and to be completed by Q1 2024
- Final outcome from the data set to be used for resource mapping and lobbying for support in identified weak areas

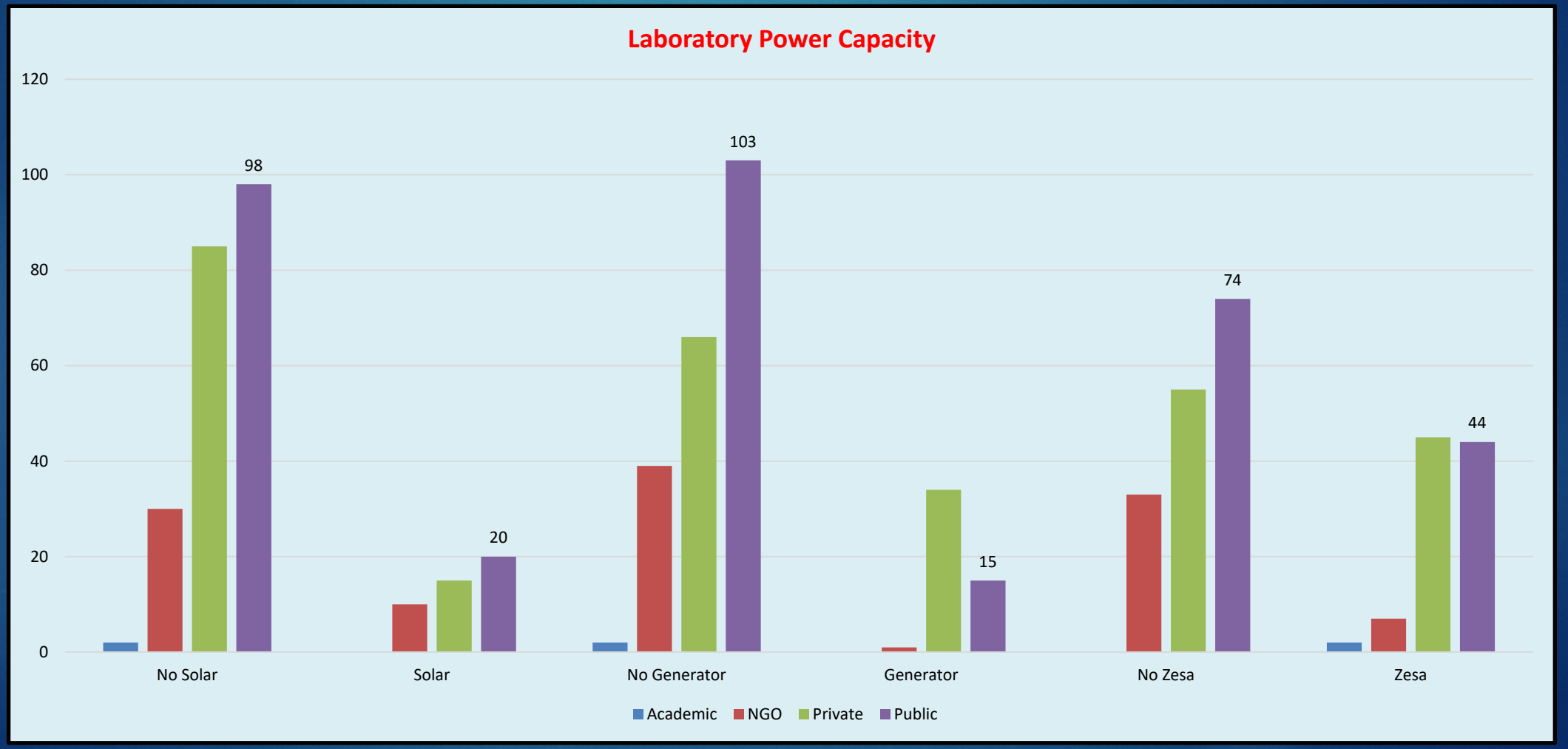
Map Showing Geo-Location of Zimbabwe Labs



Preliminary Outcomes - Infrastructure

- Preliminary analysis from the laboratory mapping data indicate gaps within laboratories in terms of power back up.
- Majority of the public laboratories have power back-up challenges.
- 83% of the labs have no solar power, 87% have no generator for back-up power and 63% of the mapped laboratories have no ZESA (Main grid power).
- Generally, the power status of the public health laboratories is sub optimal and require strong interventions.
- Thus mapping data will be used to lobby for resources towards powering laboratories

Laboratory Power Capacity – Preliminary Outcomes



Prospective Use-Cases

- Ensure all labs have power backup to avoid testing interruptions.
- Inform implementation of DNO recommendations
- Inform emergency response and preparedness strategies
- Continuously review and improve IST route schedules
- Inform HR, infrastructure and equipment needs at each tier
- Define diagnostic landscape as part of the NEDL development process.
- Mobilise resources to capacitate laboratories

Prospective Use Case - Test Menus

- Final data outcomes will be used for the prioritisation of allocation of basic equipment for basic testing e.g., haematology, chemistry etc, including general equipment like centrifuges ad microscopes
- Data will result in recommendations of the optimal type, number and location of diagnostics and an associated sample referral network.
- It enables the greatest access to services to achieve disease goals and health equity

Prospective Use Case - QMS

- Final data outcomes will be used to select and target labs for enrolment onto the National Certification programme.
- Resource mapping for these labs will be done and available funding will be used for implementation
- Uniform application of EQA schemes across test menus will be implemented
- Basic QMS processes can be easily standardised and implemented

Prospective Use Case - LIMS

- Preliminary findings indicate that majority of labs are not connected to the national LIMS.
- Final data outcomes will be used to lobby for infrastructure to connect all laboratories onto the national LIMS.
- Data back up and repository will be prioritised from the outcomes
- Remote log-in of referral specimens and remote sharing of results will also be prioritised to minimise TAT

Prospective Use Case – Biosafety & Biosecurity

- Preliminary findings indicate that majority of labs have partial biosafety resources in place
- Majority of laboratory waste is managed through centralised incineration and burning.
- Final data outcomes will be used to inform proper incineration needs and appropriate laboratory waste disposal
- Standardised approach for biosafety and biosecurity packages will be prioritised considering that this area presents gaps from the mapping exercise

Prospective Use Case – SCMS

- Preliminary findings indicate that the country has a functional supply chain management system which caters for the quantification, procurement and distribution of commodities to laboratories with proper commodity inventory systems in place
- However, gaps exist in the availability of the commodities, where there are stockouts
- Final data outcomes will be used to lobby for funding of commodities in line with standardised test menus so as to arrest stockouts

Prospective Use Case – Surveillance

- Collected Laboratory mapping data will be analysed with a focus on emergency responsiveness and preparedness of the existing laboratories.

Zimbabwe Lab Mapping in Pictures

THANK YOU!