



NATIONAL RAPID LABORATORY CAPACITY ASSESSMENT

Ministry of Health and Sanitation, Sierra Leone



National Rapid Laboratory Capacity Assessment

Objectives:

- To provide recent evidence base that provides insight into the current laboratory capacity against the Basic Package of Essential Health Services (BPEHS).
- To inform planning and decision making for the National Laboratory System.
- To inform the review of National Laboratory Strategic Plan.

National Rapid Laboratory Capacity Assessment – methodology

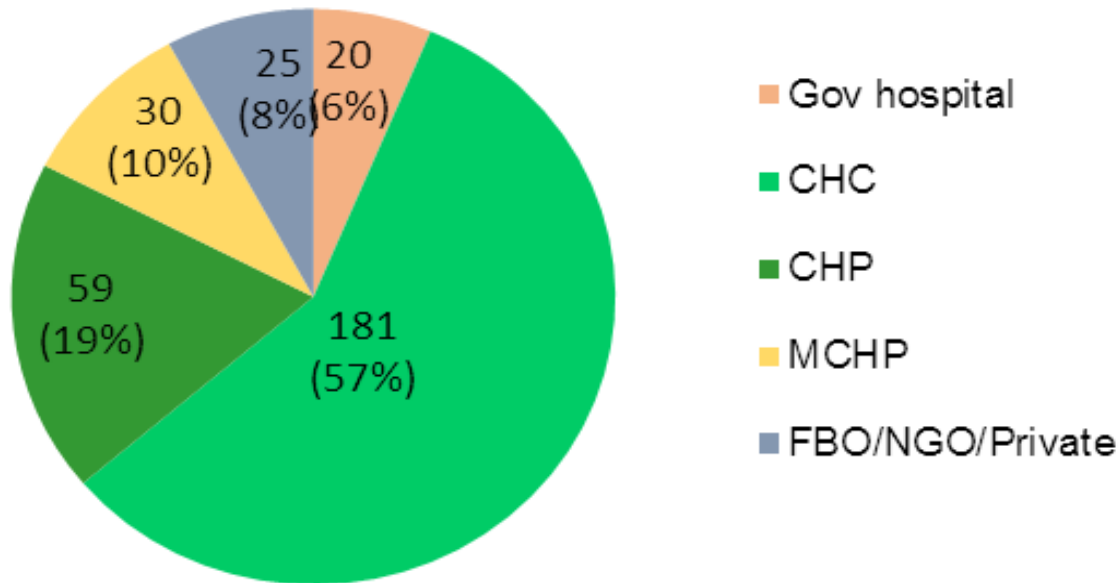
Both qualitative data (interviews, focus group discussion) and largely quantitative survey. Assessment again 14 key domains:

- | | |
|--|---------------------------------------|
| 1. Laboratory Profile | 8. Specimen Management |
| 2. Human Resources | 9. Bio-safety |
| 3. Infrastructure | 10. Public Health Functions |
| 4. Transport and Referral | 11. Organisation and Management |
| 5. Management of Consumables and Stock | 12. Data Management |
| 6. Maintenance of Equipment | 13. Supply of Consumables & Equipment |
| 7. Testing Performance | 14. Basic Testing Capability |

National Rapid Laboratory Capacity Assessment – sampling

- 315 health facilities visited and mapped:
<https://www.google.com/maps/d/edit?mid=zaSqVUe8fJfE.kg0pZZYWobN8>
- At least 22 facilities were included from each District

Health facilities included
in data collection ($n=315$)

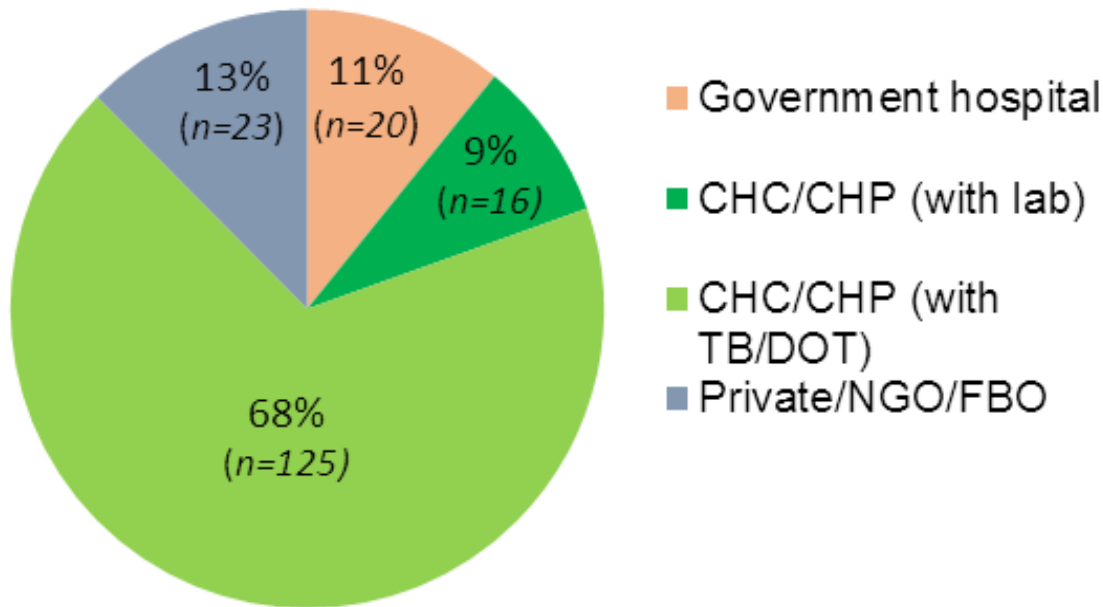


Regions/Districts	Total ($n=315$)
Northern	111
Bombali	23
Kambia	22
Koinadugu	22
Port Loko	22
Tonkolili	22
Southern	88
Bo	22
Bonthe	22
Moyamba	22
Pujehun	22
Eastern	68
Kailahun	24
Kenema	22
Kono	22
Western	47
Western Rural	23
Western Urban	23

National Rapid Laboratory Capacity Assessment – Analysis framework

- Analysis of laboratory capacity was conducted among 184 facilities that have laboratory staff to perform tests

Analysis sample ($n=184$)



SWOT analysis

Key findings: strengths

- Country-wide coverage with testing services available at all hospitals and CHCs.
- Testing services available at primary facilities.
- Laboratory management structures in place (including DHLS and LTWG).
- Sierra Leone has institutions in place that provide laboratory training.

Key findings: weaknesses

- Shortage of qualified laboratory personnel.
- There are insufficient graduates to meet the country's need for skilled laboratory staff.
- In the absence of a scheme of service, professional titles given to laboratory staff often do not reflect skills and education levels.
- No systems for continuous professional development, progression of career and remuneration.
- Weak laboratory infrastructure, power and water supply, waste disposal facilities
- Weak laboratory regulatory processes and standardisation
- Facilities often unable to offer services as per the Basic Package for Essential Health Services.

Key findings: weaknesses

- Quality of services is impacted negatively by low education levels of staff, insufficient standardisation and inconsistent quality control.
- Weak specimen transport and referral systems.
- Insufficient resourcing of laboratories.
- Delays in supply of equipment reagents and consumables is affecting availability of testing services against the basic package.
- Need to strengthen Laboratory Information Management Systems.

Key findings: opportunities

- The current development of scheme of service creates an opportunity to improve human resource systems
- Existing training institutions and courses can be upgraded to meet required standards.
- The presence of many CHCs, CHPs and MCHPs in the country, could serve as effective entry points to more advanced testing services, if referral systems are improved.
- Existing procurement systems at the NPPU and at District levels can be strengthened with improved quantification, standardised specification, procurement, distribution and storage.

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Key findings: opportunities

- There is an opportunity to leverage existing skills and knowledge among many graduates from affiliated sciences.
- The Ebola epidemic has drawn donors' attention to the urgent need to also address overall systemic challenges.

Key findings: threats

- Unreliable laboratory testing affects treatment of the patients, disease control and could lead to wastage of resources.
- Reduced health system performance, as laboratories will play an important role in reducing the burden on Sierra Leone's health system..
- Sierra Leone's Laboratory Systems will be insufficiently able to prevent the outbreak of epidemics.
- Inefficient allocation of resources could result in wastage unless a clear understanding and investment in key priorities as set by MOHS.
- Insufficient biosafety means and systems can pose a threat to the health and safety of laboratory staff, communities and the environment.
- There is a high risk that the country is unable to retain graduates if weaknesses in the human resource system are not addressed.

Key findings

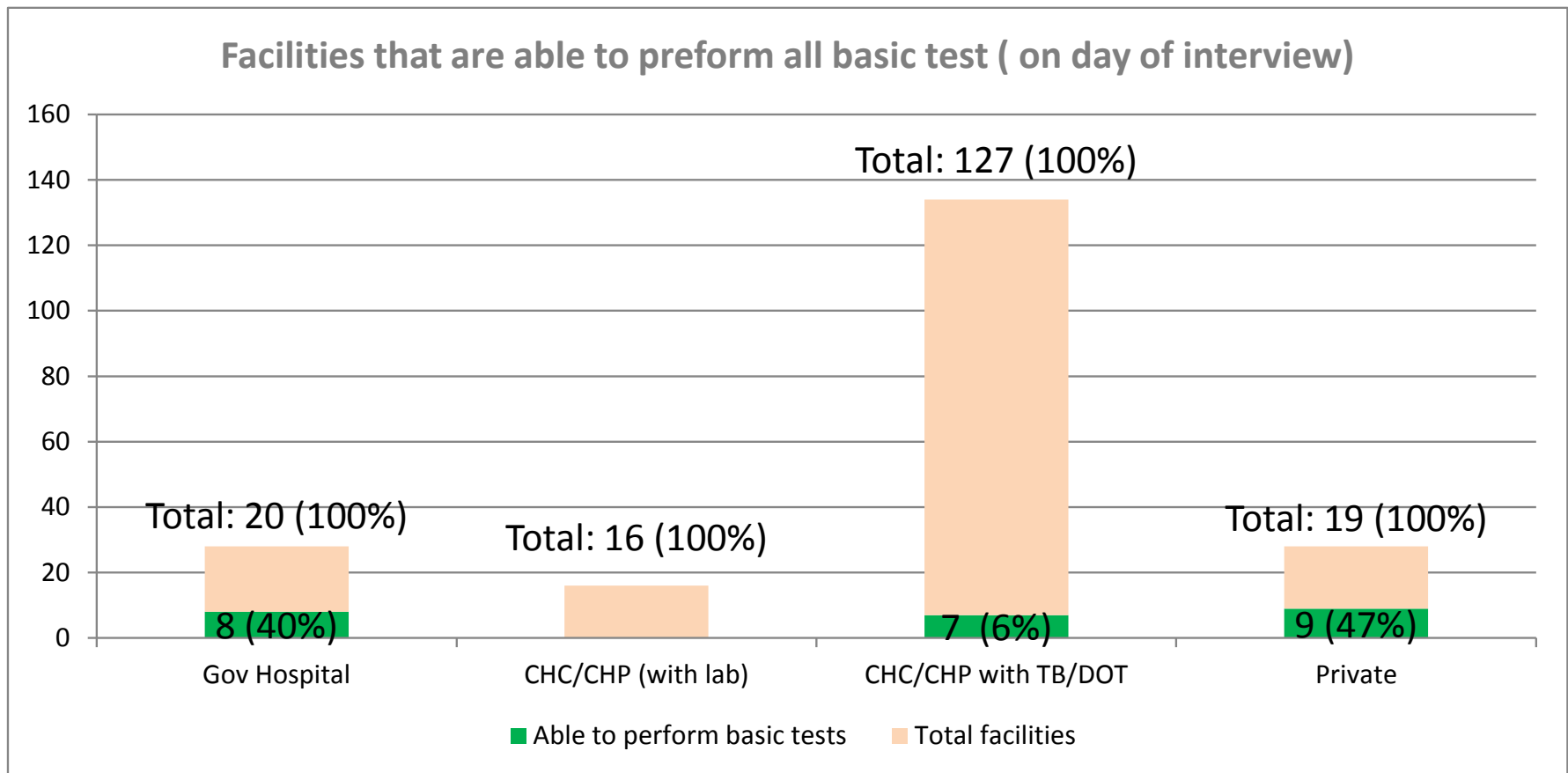
Key findings: human resources

- Insufficient numbers of appropriately trained laboratorians
- Inadequate evidence of standardised training/qualifications.
- There is no formal clear scheme of service for laboratories has been implemented.
- Capacity among higher education institutions that train laboratory staff is limited without standardized curricula.
- Many laboratory workers conduct microscopy for TB, but are without a formal mandate to perform other clinical laboratory diagnostics.

	Secondary Level Education and Lower	Certificate	Diploma	Graduate	Post- Graduate	
Laboratory Superintendent	1	1	10	2	2	16
Laboratory Scientist	0	0	2	1	0	3
Laboratory Technician	20	10	208	0	0	238
Microscopist	14	0	0	0	0	14
Laboratory Assistant	97	46**	7	1	0	151
Clerical	0	1	0	0	1	2
Auxiliary	5	0	0	0	0	5
Volunteer	17	2	4	0	0	23
	154	60	231	4	3	452

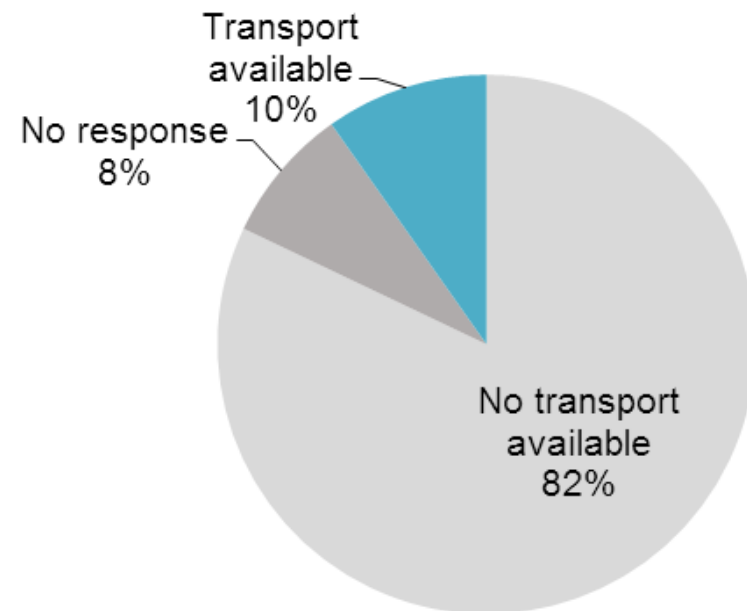
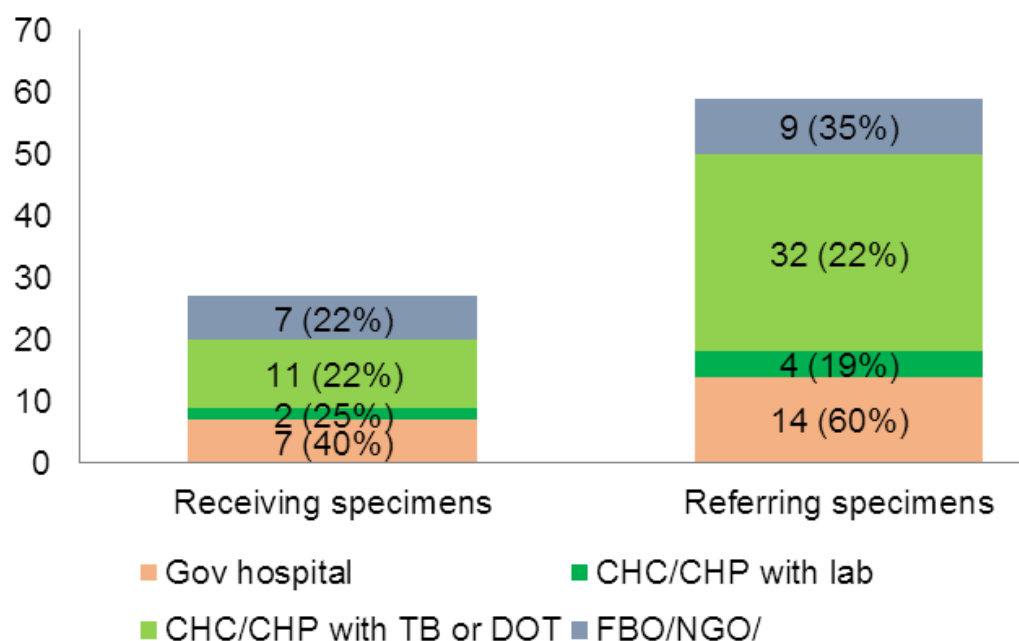
Key findings: testing services

- Thirteen percent (13%) of the 184 lab facilities providing laboratory testing were able to readily deliver a selected number of eight essential basic tests
- The assessment provides an overview of tests available at laboratories against the basic package.



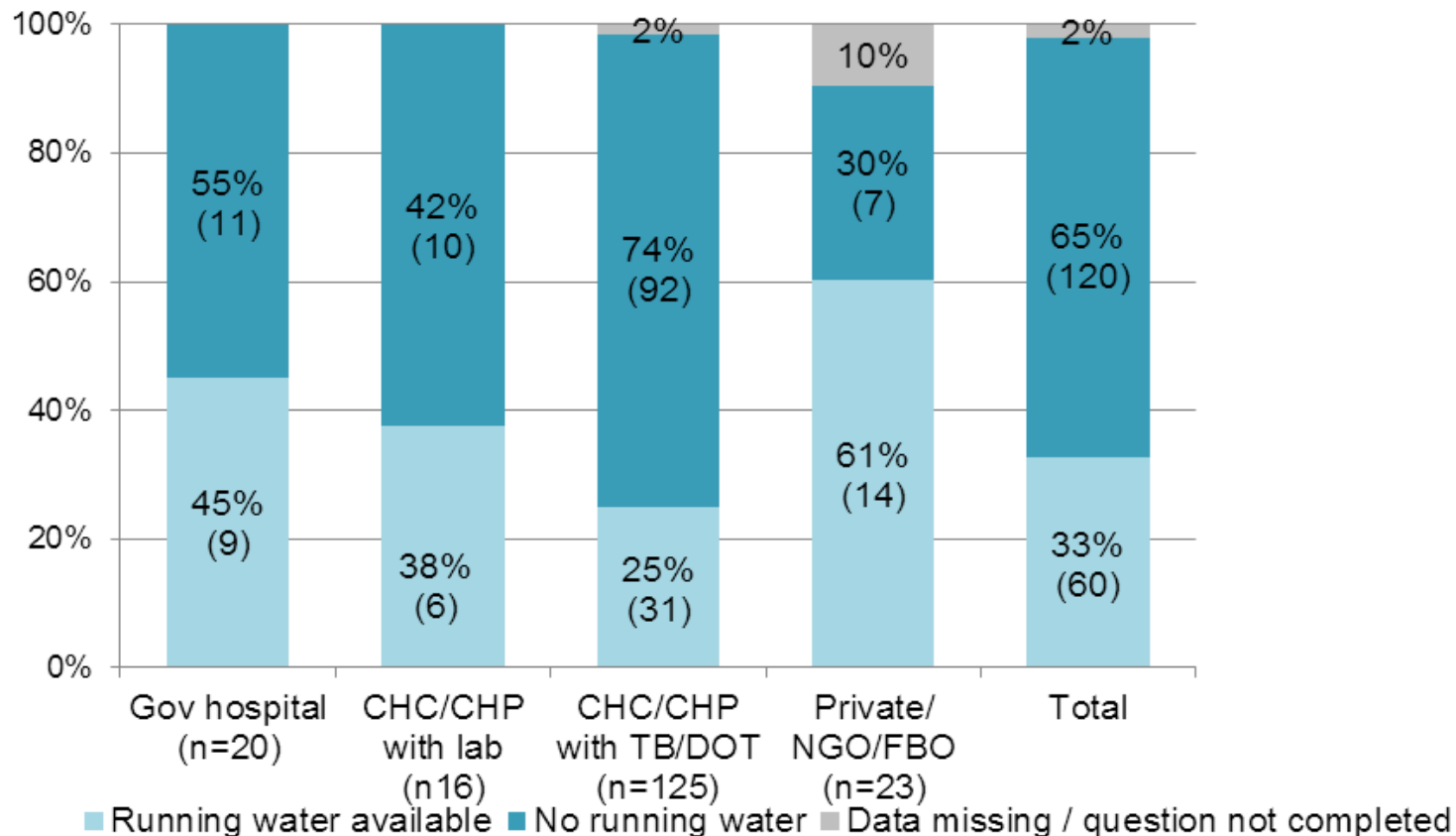
Key findings: transport and referral

- 26% of CHCs and CHPs with laboratories or TB/DOT centres refer specimen to a higher level facility.
- Few facilities (13%) were able to provide appropriate packaging for specimen transportation.
- 82% of all facilities did not have a designated transport method, and relied on private vehicles for transporting specimen.



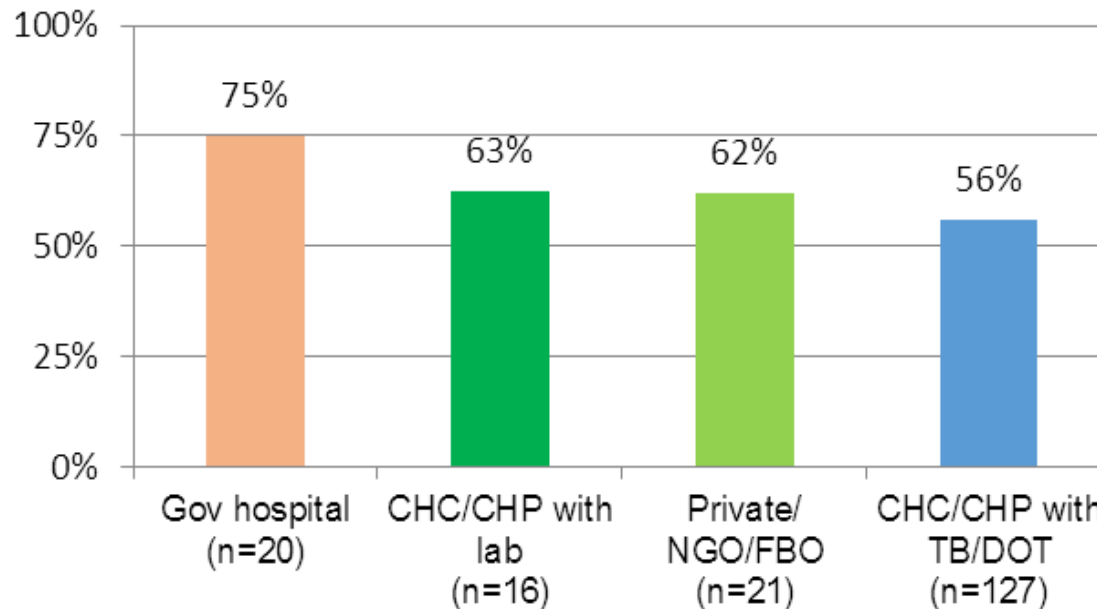
Key findings: infrastructure

- All hospitals had at least one source of electricity.
- A quarter (27%) of all community health centres did not have any source of electricity, hampering their ability to provide 24-hour curative services, as laid out in the basic package of essential health services.
- Two thirds (65%) of all laboratories did not have dedicated water supply.



Key findings: reagents and equipment procurement, supply chain

- Laboratories are experiencing delays in supply and frequent stock-outs.
- There is insufficient capacity to purify or distil water: 82% of facilities lack a water distillation unit and 80% lack chemicals or a filter to purify water.
- Laboratories lack adequate equipment inventories, maintenance and repair plans.
- Inadequate local maintenance and repair capacity is available to many facilities, particularly those based in rural settings.



Proportion of laboratories among 184 facilities experiencing delays with reagent delivery (n=184)

Key findings: Quality management

- No standardized SOPs are in place across vast majority of laboratories
- EQA and IQC mechanisms are in place at some facilities, mainly for basic tests.
- 29% of facilities reported have an organizational structure in place.
- Most facilities (55%) organised a meetings when a particular problem occurred. 32% provided written reports or minutes.

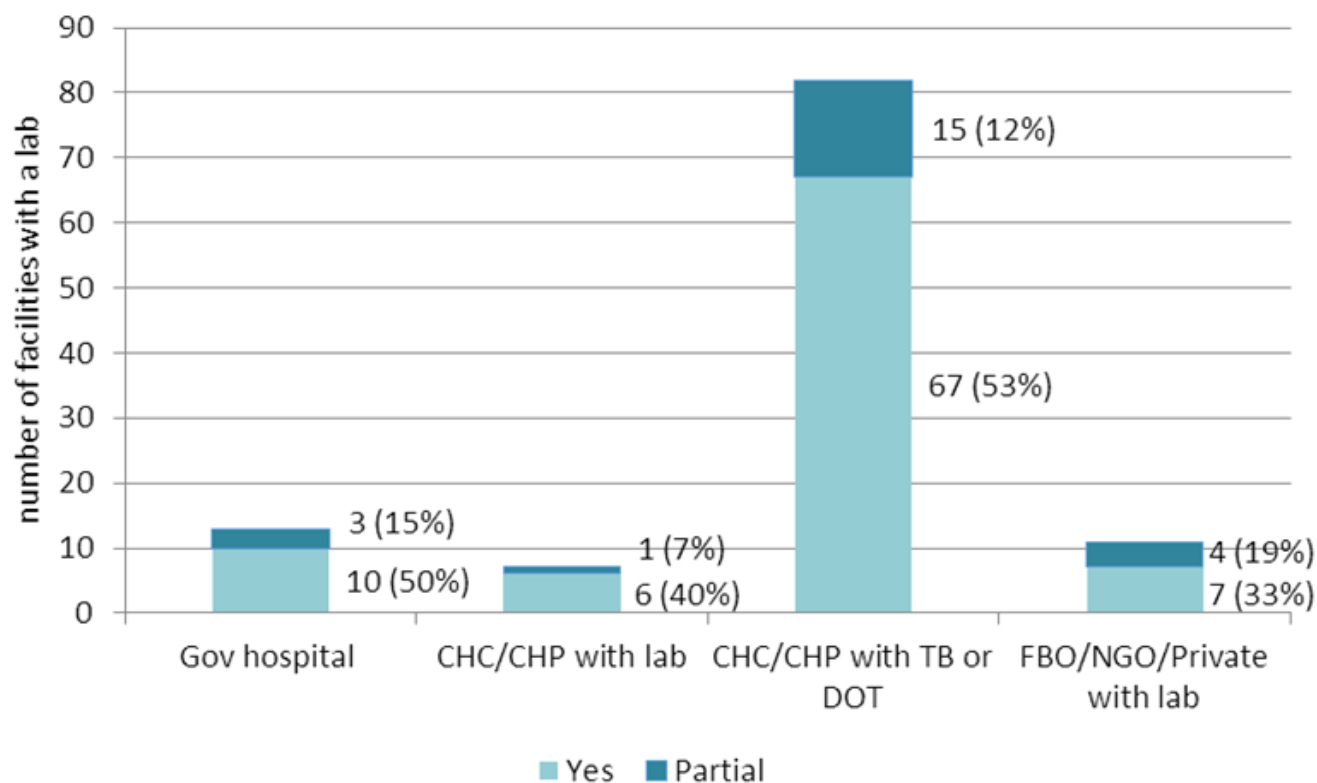
- More than 50% of facilities have SOPs
- Between 25% and 50% of facilities have SOPs
- Less than 25% of facilities have SOPs

Tests	Gov hospital	CHC/CHP with lab	CHC/CHP with TB or DOT	FBO/NGO/Private with lab
Haemoglobin	● 4 (20%)	● 2 (50%)	● 5 (21%)	● 5 (28%)
Malaria parasites	● 4 (21%)	● 2 (25%)	● 3 (11%)	● 2 (13%)
Urine microscopy	● 4 (21%)	● 2 (25%)	● 2 (6%)	● 2 (12%)
Sputum AFB- Ziehl Nielsen stain	● 2 (13%)	● 4 (40%)	● 21 (19%)	● 2 (17%)
Blood Microscopy (tryp, filarial)	● 1 (8%)	N/A	● 2 (22%)	● 3 (33%)
RDT for malaria	● 1 (8%)	● 4 (36%)	● 15 (19%)	● 2 (11%)
Skin snip (Oncho)	● 1 (6%)	N/A	● 3 (11%)	● 1 (8%)
Blood glucose	● 2 (11%)	● 2 (67%)	● 1 (8%)	● 1 (7%)
Rapid pregnancy test	● 2 (11%)	● 2 (22%)	● 7 (16%)	● 2 (13%)
Urinalysis	● 1 (7%)	● 2 (22%)	● 3 (9%)	● 2 (15%)
HIV Rapid Test	● 4 (27%)	● 3 (27%)	● 13 (16%)	● 5 (28%)
RPR test for syphilis	● 3 (17%)	● 1 (20%)	● 1 (14%)	● 2 (13%)

Key findings: Information management systems

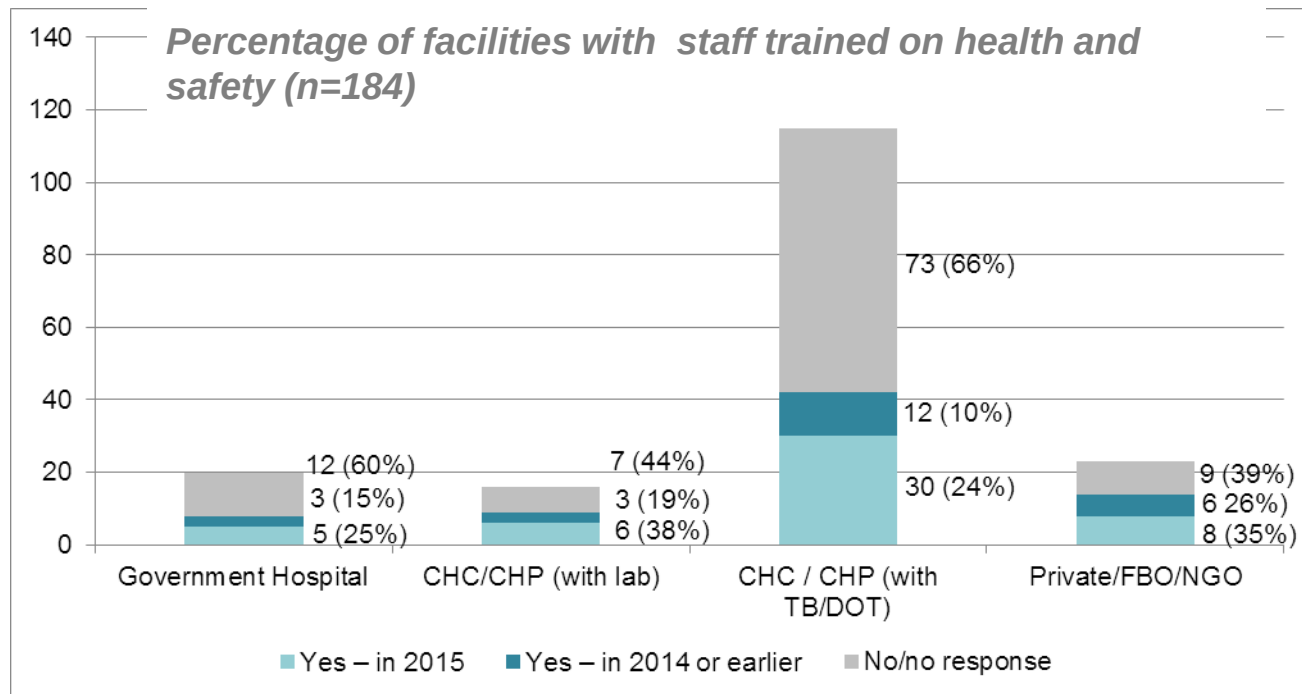
- Though there is some standardised data reporting as part of Sierra Leone's surveillance system, there is no overall Laboratory Information Management System (LIMS).
- The lack of designated phones and computers with internet at laboratories will need to be addressed to facilitate improved data reporting.

Facilities with lab/TB/DOT that use a standardised reporting format (n=184)



Key findings: Bio-risk management

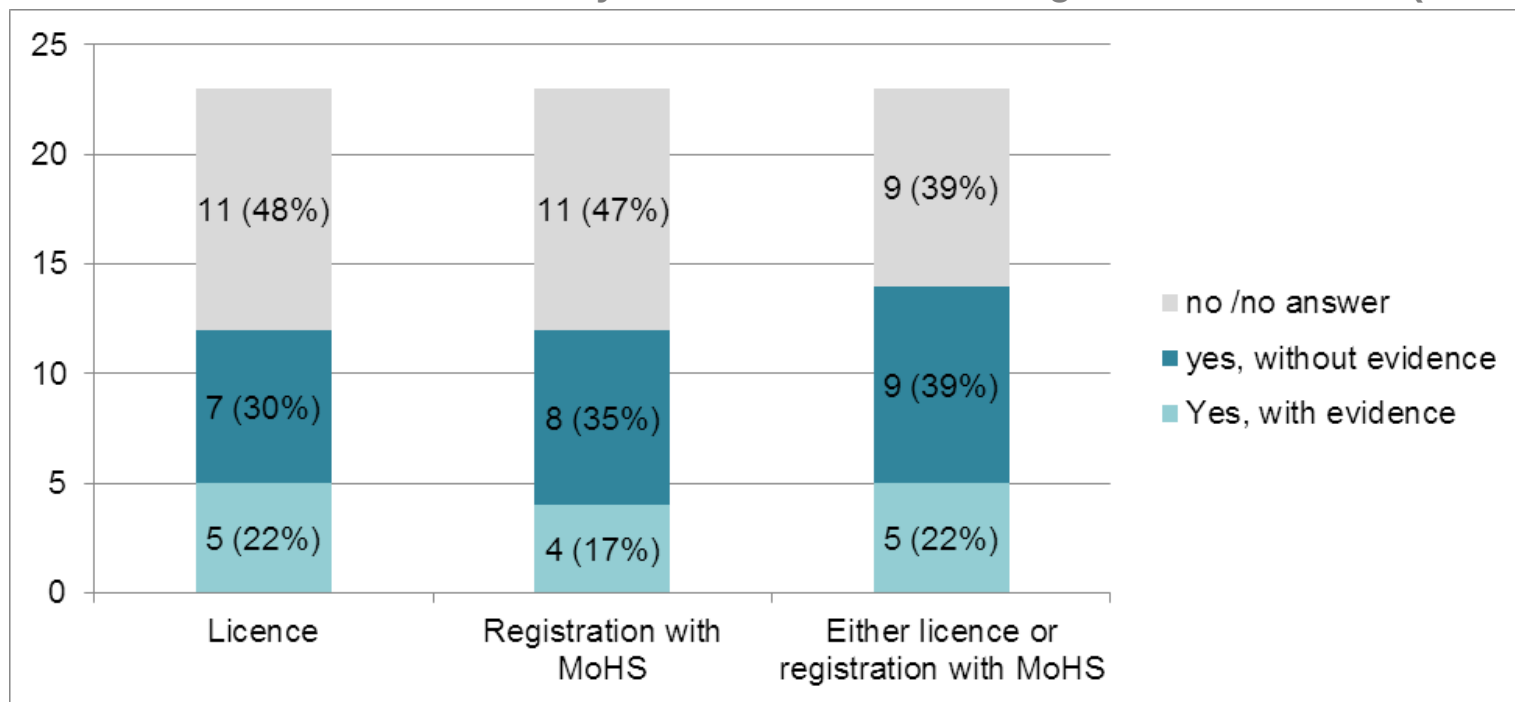
- 11% of facilities have health and safety protocols in place.
- 51% of facilities received a visit during the last year from someone who came and check health and safety at the facility.
- Staff at 40% of facilities have staff in place who are trained on health and safety. 27% of facilities have laboratory staff were trained in 2015.
- 54% of facilities have waste management procedures in place.
- Shortages in supplies of essential biosafety and waste disposal equipment.



Key findings: Laboratory governance

- No laboratory accreditation, registration and licensing systems are currently in place for laboratories.
- Laboratories receive insufficient priority during government and facility level planning and budgeting processes.
- Laboratory government budgets have not been ring-fenced.
- Laboratories and TB/DOT centres are funded through a mix of different sources, requiring strong coordination between government and donors.

Private laboratories that indicated they had a licence or were registered with MOHS (n=184)



Recommendations

Recommendations:

1. Human resource systems for laboratory personnel need to be strengthened, including availability of quality training programmes for all levels of laboratory staff, to enable Sierra Leone to become self-sufficient in generating laboratory personnel at all levels.
2. Bio-safety policies and procedures should be established and laboratories should be enabled to comply with these, to ensure the safety of medical laboratory personnel, the communities and environment surrounding the laboratory.
3. Infrastructure at key laboratories needs to be upgraded, with priority given to government hospitals and CHCs to enable them to provide safe and comprehensive testing services. Priority should be given to addressing power shortage, water supply, cold storage and biosafety facilities.
4. To increase access to testing services, referral networks needs to be established and supported by safe specimen transport means.

Recommendations

5. The laboratory supply chain system needs strengthening, to prevent interruption of services due to insufficient equipment or reagents.
6. A Laboratory Information Management System needs to be established to ensure improved availability and use of laboratory data.
7. Quality management systems need to be strengthened with the introduction of accreditation mechanisms and implementation of External Quality Assurance Schemes.
8. Essential laboratory practice, bio-safety, quality, service, and equipment standards need to be agreed. Current laboratory governance structures needs to be supported by a regulatory agency with the authority to implement and enforce these laboratory standards.
9. Laboratory funding mechanisms need to be strengthened, coordinated and investment decisions informed by and channelled to priority needs.