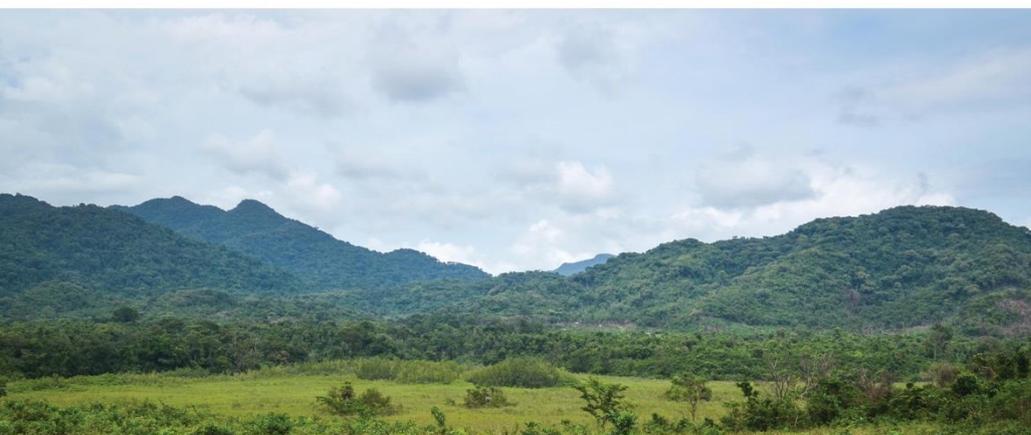




Summary Report of the 2017 SARA Plus in Sierra Leone:

Service Availability and Readiness Assessment (SARA),
Quality of Care Survey, and Data Quality Review



Government of Sierra Leone
Ministry of Health and Sanitation

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Foreword

The Sierra Leone Service Availability and Readiness Assessment (SARA) conducted in 2017 is the first health services census to be implemented in the country. The use of standard, tested tools allowed the SARA to provide information on:

1. The availability of health services at the facility level
2. The availability of inputs needed to deliver the basic package of essential health services
3. The readiness of health facilities to provide health services

This 2017 SARA is unique because a data quality review and a quality of care survey were also conducted. Their findings are presented in this summary report. This document is therefore called *SARA Plus 2017 (SARA+)*. The inclusion of the quality of care survey expands insights on the effectiveness of health services in Sierra Leone. The data quality review provides information on the quality and integrity of routine health data generated and regularly used to make operational and strategic decisions. Collectively, the SARA+ report provides rich information on the entire supply side of health service delivery in Sierra Leone.

The findings in this report are informing strategic directions taken nationally and subnationally and are guiding financial and other resource investments. As the health sector makes progress in the implementation of the basic package of essential health services, the SARA+ 2017 results are central to identifying priorities and areas of emphasis.

I encourage all stakeholders to use this report for strategic planning, resource allocation, scaling up health programme operations, and monitoring and evaluation. The SARA+ 2017 document is an important reference for baseline data post-Ebola.

On behalf of the Ministry of Health and Sanitation (MOHS), I wish to extend our appreciation to the Department of International Development (DfID) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund) for funding the exercise, and to the World Health Organization (WHO) and John Snow, Inc. (JSI) for providing technical assistance.

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Chief Medical Officer

Ministry of Health and Sanitation

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We are grateful to all heads of departments, divisions, and programmes in the MOHS. We also acknowledge district medical officers, hospital superintendents, Monitoring and Evaluation officers and their respective teams who fully engaged in the adaptation of the questionnaire and its testing, and in the data validation and report writing processes. District Health Management Teams are thanked for their support of logistical planning, quality assurance and assistance to the field teams during data collection.

Our appreciation also goes to all the members of the technical implementation team. The team was led by the MOHS SARA coordinator, Mr Edward Foday. Other MOHS staff included Mr Alhassan F. Kanu, Mr Philip Amara, Mr Abdul Konomanyi and Mr Wogba Kamara. WHO technical assistance was contributed by Dr Adewale Akinjenji and later by Dr Nuhu Yaqub (WHO Sierra Leone office); Dr Amani Siyam (WHO headquarters/Geneva); Dr Sam Omar and Dr Mekdim Ayana (WHO/Inter-country Support Team [IST], Ouagadougou); Mr Monde Mambimongo (Regional Office for Africa, WHO Brazzaville); and Dr Gebrekidan Mesfin (WHO Liberia Office). Global Fund technical assistance was outsourced to JSI. Thanks to Dr David Boone and Mr. Suleiman Foray of JSI, and for the support of the JSI Office in Sierra Leone, especially Chief of Party Dr Laurentiu Stan, and Finance & Operations Director Zaira Alonso. We also appreciate the contribution of the consultancy services offered by Mr Robert Sam-Kpakra and Mr Chet Chaulagai from JSI, and by Dr Martin Osumba for WHO.

The exercise could not have been completed without the dedicated work of about 90 enumerators (including data collectors, supervisors and back-checkers) who successfully collected data across the country. We thank them. The MOHS would also like to thank all other partners and people whose names may have been inadvertently left out, who were either consulted during the development and administration of the SARA+ questionnaire or contributed to processes in other ways. We acknowledge that without their contributions, this work would not have been possible. We are greatly indebted to them.

Dr SAS Kargbo

Director of Policy, Planning and Information
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Abbreviations

ACT	artemisinin combination therapy
ANC	antenatal care
Apgar	activity, pulse, grimace, appearance, responsiveness [score]
ART	antiretroviral therapy
ARV	antiretroviral
BEmONC	basic emergency obstetric and neonatal care
C&S	culture and sensitivity
CAPI	computer-assisted personal interviewing
CBC	complete blood count
CEmONC	comprehensive emergency obstetric and neonatal care
CHC	Community Health Centre
CHP	Community Health Post
CPT	cotrimoxazole preventive therapy
CSF	cerebral spinal fluid
CSPRO	Census and Survey Processing System
CT scan	computed tomography scan
CXT	cotrimoxazole
DBS	dry blood spot
DCG	Data Collector's Guide
DfID	Department of International Development
DHIS 2	District Health Information Software version 2
DHMT	District Health Management Team
DPT	diphtheria, pertussis and tetanus vaccine
DQR	Data Quality Review
ECG	electrocardiograph
FP	family planning
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoSL	Government of Sierra Leone
HCT	HIV counselling and testing
HiB	haemophilus influenzae type B
HFA	health facility assessment
HMIS	health management information system
HPV	human papillomavirus
IMCI	Integrated Management of Childhood Illnesses
IMEESC	Integrated Management for Emergency and Essential Surgical Care
INH	isoniazid

IPT	intermittent preventive therapy
IPV	inactivated poliovirus vaccine
IS	information system
ITN	insecticide-treated net
IUCD	intrauterine contraceptive device
JSI	John Snow, Inc.
M & E	monitoring and evaluation
MCHP	Maternal and Child Health Post
MDR-TB	multidrug-resistant tuberculosis
MFL	master facility list
MNCAH	maternal, newborn, child and adolescent health
MOHS	Ministry of Health and Sanitation
OPV	oral polio vaccine
ORS	oral rehydration salt
PHU	Peripheral Health Unit
PMTCT	prevention of mother-to-child transmission
QoC	quality of care
RDT	rapid diagnostic test
RMNCAH	reproductive, maternal, newborn, child and adolescent health
RMNCH	reproductive, maternal, newborn and child health
SARA	Service Availability and Readiness Assessment
SARA+	SARA <i>Plus</i>
SPSS	Statistical Package for the Social Sciences
STI	sexually transmitted infection
TB	tuberculosis
TT	tetanus toxoid
VF	verification factor
WHO	World Health Organization

Chapter One: Executive Summary

1.0 Background

The Service Availability and Readiness Assessment (SARA) provides essential information on service delivery by evaluating service readiness and capacity at district and health facility levels; assessing the equitable and appropriate distribution of services and resources; and providing the health sector with skills and tools for monitoring service and resource availability on a regular basis. The SARA provides essential information on the status of the health system in terms of service accessibility (for example, density of health facilities and beds, the availability of core health workers, service utilization), and the readiness of facilities to provide an adequate level of service (for example, availability of trained staff, diagnostics, equipment and medicines), for both general health services and specific key health interventions (for example, maternal and newborn health, HIV/AIDS, tuberculosis [TB], and malaria diagnosis and treatment).

The Ministry of Health and Sanitation (MOHS) of Sierra Leone integrated a Data Quality Review (DQR) and Quality of Care (QoC) assessment of service delivery at health facilities in the 2017 SARA. The current SARA is therefore called SARA *Plus* (SARA+).

1.1 Methodology

The SARA was conducted as a census of all health facilities in Sierra Leone. The current master facility list (MFL) was used as the default list for inclusion. Unique facility codes were generated with the structure [xx xx xxxx], the first two digits denoting the region, the second two digits denoting the district, and the last four digits denoting the facility number. The World Health Organization's (WHO) SARA questionnaires, version 2017, were customized for Sierra Leone during a three-day workshop. Field enumerators were competitively selected and interviewed by the MOHS. Following a ten-day training workshop for the enumerators, a total of 62 were selected. Twenty-one pairs of enumerators were formed, each with responsibility for an average of 56 facilities. Travel logistics were considered when assigning enumerator pairs to facility clusters, allowing each pair to complete the survey in an average of 39 days. Ten supervisors were trained and assigned responsibility for the supervision of two clusters each, including final responsibility for uploading the Census and Survey Processing System (CSPRO) facility data files to the central server. The Western urban and rural districts were covered by all enumerators as part of on-the-job training, under close supervision of the SARA survey team from the MOHS, which included the WHO and Global Fund/JSI consultants. Ten back checkers were selected and trained to conduct quality assurance. The back checker team re-collected data from 5% of randomly selected facilities.

The DQR and the QoC assessment were conducted in a sample of 10% of the facilities (150 sites), proportionately selected to include facilities that offered antenatal care (ANC), delivery and newborn care, and HIV, malaria and TB care services.

1.2 Service Availability and Readiness Assessment

The SARA results indicated that health facilities providing primary health care services were generally available across the country. However, hospitals offering comprehensive specialized

health care were not well distributed; they were concentrated in urban areas. **In general, there was need for significant infrastructural investment to bring all health facilities in compliance with the norms and standards for the basic package of essential health services.** Thirty percent (30%) of health facilities lacked adequate and appropriate space for consultation rooms. Basic amenities should also be prioritized. Only 2% of facilities had all the tracer basic amenities, including sanitation facilities, communication equipment, improved water sources, emergency transport, consultation rooms, power sources and internet connectivity. Forty-three percent (43%) of the facilities did not have any of the tracer basic equipment. In addition, about 75% of health facilities did not have the basic equipment needed for completing clinical examinations, including stethoscopes, thermometers, blood pressure machines and scales. Generally, the diagnostic capacity was low for both laboratory and imaging services. It was notable that two of every three health facilities assessed did not have any of the tracer laboratory diagnostic tests, and only 19% had basic and advanced diagnostic imaging services.

The health workforce is a critical input for ensuring that the health system functions optimally and provides quality services. Sixty four percent (64%) of the health workforce was nursing staff; 29% were maternal child aides; community health officers and midwifery professionals were 8% each; 6% were doctors; and 3% were community health aides. The health worker to population ratios were low for all cadres of staff. **There is a need for planned investment to increase the health workforce across all cadres.** Notably, 35% of doctors who offered services were either part-time staff or volunteers. **Consultative discussions are required to establish policy that allows for the absorption of these staff into government employment and the attraction of new talent through active training and recruitment.** The workforce had a skewed distribution in favour of urban settings. **The policy position taken should advocate for and establish an enabling environment to attract and retain staff in rural settings.**

Service availability and readiness of health facilities to provide services varied across facilities and services. In general, *family planning (FP)* services were available, at 96% of facilities. However, only 17% of facilities had all the tracer items needed to provide FP services. **The readiness to provide FP services can be improved through targeted staff training and provision of service guidelines and aides, securing commodities and procurement of FP equipment, especially items required for surgical methods.** *ANC services* were highly available across facilities and districts, at 97%. **Investments should be targeted at improving laboratory services to provide the antenatal profile and ensure commodity security.** *Child immunization* services were offered by 95% of facilities. **To enhance immunization service readiness, the focus should be on improvement of cold chain equipment and maintenance of the cold chain.** One in every three health facilities assessed did not have a refrigerator, and only one third of facilities could maintain adequate refrigerator temperatures. Vaccine stockouts occurred in less than 10% of the facilities. The human papillomavirus (HPV) vaccine was not stocked in any health facility. *Child and adolescent health* services were available in over 80% of the facilities. **Improvements in its service readiness should address limitations in laboratory diagnostic services.** Less than 4% of facilities were ready to offer the tracer microscopy and blood haemoglobin tests for child health services. Adolescent health services were not integrated in primary health care services. Eighty-eight percent (88%) of facilities offered adolescent FP services, whereas 34% offered adolescent antiretroviral therapy (ART) services. **Scaling up adolescent health**

services requires the dissemination of guidelines, training of staff on how to provide adolescent-friendly services and updating the service policy to adopt the integration of adolescent health services in all primary health care services. *HIV counselling and testing (HCT)* services were available at two thirds of the facilities. However, service readiness was lacking in terms of the adequacy and appropriateness of consultation rooms that allow for privacy and confidentiality. The availability of *prevention of mother-to-child transmission (PMTCT)* services was low; less than two thirds of the health facilities offered the service. The availability of the spectrum of services varied. The least available service was antiretroviral (ARV) prophylaxis to exposed newborns (44%), and the most available service was HCT of HIV-positive pregnant women (60%). One third of health facilities provided *HIV care and support* services. There was variability in the availability of the spectrum of related services, ranging from 11% of facilities providing treatment for Kaposi sarcoma, 13% of facilities providing preventive TB treatment, and 33% providing FP counselling and condom distribution. **Overall, readiness for the provision of HIV care and treatment services was limited by the inadequacy of auxiliary laboratory services.**

1.3 Quality of Care Assessment

Findings from record reviews conducted for HIV testing, malaria services, ANC, delivery services and immediate postpartum care for the newborn at an average of 82 facilities and for TB services at 42 facilities are presented. Documentation in individual patient medical records and registers, where individual patient information was recorded, was used to capture patient services that were provided, and routine monitoring that was carried out on patients receiving services over time (for example, ANC, TB). International experts identified elements for each service that should be documented (if relevant). They included diagnostic criteria, diagnostic methods used, evidence to support the diagnosis, routine services that should be provided for the diagnosis, and monitoring that should be routinely conducted.

HIV testing services refers to patient-initiated testing for HIV. Documentation of key information for HIV test clients was assessed for 410 patients from 82 facilities using record or register reviews. On average, 95.7% of the records for clients with negative test results across the facilities had documentation that the patient had received the results. There was no complete documentation for patients receiving their test results, and for receiving post-test counselling. The weakest item for documentation was knowledge of the results of any referral for HIV care and support services. All positive patients should be referred to care and support for follow up, and if eligible, they should be placed on ART. Only about half of the facilities reported that they prescribed ART (data not shown). Comparing the results for documentation of patient follow up (enrolling in care and support services or knowledge that the patient refused referral) with the availability of ART services in the facility, no consistent patterns were found. Documentation of the distribution of condoms was not related to the availability of condoms in the HIV testing service site.

Overall, districts in the Northern region consistently documented less on HIV testing services; this region also had the fewest resources to support services, including guidelines that would reinforce the services expected to be provided.

Improving QoC requires consistently reminding service providers of the service components they are expected to provide, and monitoring (for example, through supervision) that service

provision is consistently documented. Based on the results of the record review and the related information in the SARA, **recommendations to improve the quality of HIV testing services include:**

- Develop a functional system to receive follow-up information about patients referred for care and support services, especially when the services require referral to another facility. This is important to improve the outcome for HIV-infected persons and for preventing transmission.
- Ensure that guidelines are available at the service sites to reinforce the service components that are expected to be delivered.
- Distribute condoms routinely and document it. Recording that patients took condoms provides information that is important for monitoring service provision.

Quality malaria services are defined as suspect malaria patients (for example, with fever, lethargy, other symptoms of possible malaria) being identified, having a blood test for malaria, and being treated appropriately. Among the suspect malaria patient records reviewed, 93.3% received a blood test for malaria and had the result recorded. Among all suspect malaria patients, 87.1% were found to be test positive for malaria. The most common method used for diagnosis among all the suspect malaria patients was the rapid malaria test (90.9%). Among other patients, 3.8% were diagnosed by blood smear, 2.8% were diagnosed using clinical signs and symptoms only, and the method for diagnosis for 2.6% of the patients was uncertain.

In total, 74.5% of the suspect malaria cases were treated appropriately, with test positive cases receiving the appropriate dose of artemisinin combination therapy (ACT), and test negative cases receiving no antimalarial. On average, 21% of the records assessed did not show malaria positive cases being correctly treated. This was due to no ACT being prescribed (0.8%), incorrect ACT dosage recorded (15.3%), the ACT dosage not being recorded (4.5%), provision of another antimalarial and ACT with the wrong dose or dose not recorded (9.8%). However, on average, 2.3% of the patients who had a positive malaria test and received the correct dose of ACT were also prescribed an additional antimalarial drug.

Recommendations to improve the quality of malaria services include addressing the rapid test kit and medicine stockouts, clinical mentorship, supervision, and training to improve dosing.

Records for *ANC* and for *delivery and newborn care services* were reviewed for key elements of ANC services, delivery services, and immediate postpartum care. The selection criteria were that women should have recently delivered at the facility and then been discharged. Six hundred fifty-two records (652) at 132 facilities were examined for women receiving ANC and delivery/newborn care services, with an average of five records per facility reviewed.

WHO recommends four ANC visits to provide a minimum level of monitoring for risk factors and complications during pregnancy, and treatment or other interventions to reduce maternal and fetal risk. The facility average number of ANC visits among women whose records were reviewed was 3.5 visits. The facility average for women who had made four or more ANC visits—an international indicator of QoC for ANC—was 57.8%.

The facility average for records of *birth plans* was only 4.2%. The facility average for women with *anaemia screening* documented was 58.9%. However, the SARA found that among the facilities assessed for QoC, only 10% (13 facilities) had the capacity to conduct a blood test for

haemoglobin or haematocrit, so it is likely that the notes on anaemia described physical findings rather than actual measures. The facility average for recording that they had *screened for syphilis* was 5.1%, yet 14% of the facilities assessed had a rapid syphilis test available. The facility average for two *tetanus toxoid (TT) injections* was 67.3%. The SARA findings were that over 90% of facilities reported that TT was a routine component of ANC. To assess the quality of documentation of *delivery services*, the partograph was reviewed. The facility average for use of partographs was 69.7% while the facility average for documenting *provision of oxytocin* was 73.2%. The *maternal outcome* (live, death, complications) was recorded at a facility average of 85.8%, whereas 89% of the records across facilities documented that the woman stayed 24 hours after birth.

To improve the QoC for ANC, the following recommendations are offered: refresher training of staff on the need for accurate documentation of services rendered; strengthening supportive supervision to address staff skill gaps through on-the-job training and mentorship; adoption of low cost modalities for testing for anaemia in pregnancy; investing in the laboratory infrastructure to support full antenatal profile screening tests; and strengthening programming to improve service utilization.

The assessment of QoC for *newborn services* included record reviews for *infant outcome recorded*. An average of 94.4% of the records at all facilities had the infant outcome (stillbirth, livebirth, complications) recorded. Across the facilities, an average of 72.1% had the *activity, pulse, grimace, appearance, and responsiveness (Apgar) score* recorded, at both 1 and 5 minutes postpartum. The *birthweight* was recorded on a facility average of 81.7% of records, whereas functional infant scales were found in the delivery service area in 73% of the facilities. It is recommended internationally that *Bacillus Calmette–Guérin (BCG) vaccine* be provided at birth—taking advantage of access to the infant—because this is a vaccine that is effective at that age. An average of 33.9% of the records across facilities had a birth-dose BCG recorded.

To improve delivery services, the following recommendations should be considered: supportive supervision and mentorship to ensure that Apgar score assessment and documentation are completed accurately by the midwives; a treatment protocol should be developed and disseminated on the use of oxytocin; and reinforcement of the policy on BCG vaccine at birth, supported by investments to improve the cold chain infrastructure.

Quality of TB care had one inclusion criterion for TB patient record review: patients who had completed at least five months of TB treatment. Almost all patients had begun treatment within seven days of confirmed diagnosis, with a facility level average of 32% of patients starting treatment on the day of diagnosis, and an additional 60% starting within the first seven days after diagnosis, with the day of diagnosis counting as day 1. Although all facilities reported using clinical methods to diagnose TB, most also reported using sputum smears. Almost all patients across the facilities were diagnosed using two sputum smears (82%). GeneXpert (which also provides evidence of rifampicin sensitivity) was only used with an average of 1% of patients across all facilities. The full DOTS first-line treatment (isoniazid [INH], rifampicin, ethambutol, pyrazinamide) was available in most (90%) of facilities. As for *Rifampicin sensitivity testing*, this practice was not widely used. All patients whose records were reviewed were on the first-line regimen.

Recommendations to improve TB services include improving the laboratory diagnostic services to allow for sputum testing, sensitivity testing and HIV coinfection testing; and improving the documentation of the services rendered.

1.4 Data Quality Review

The Data Quality Review (DQR) was implemented as part of the larger health facility assessment (HFA) of service availability and readiness. The DQR component (like the QoC assessment) was implemented on a nationally representative sample of health facilities. Developed by WHO and its partners, the DQR employs a standard set of indicators, data collection tools, analytical tools, and format for the presentation of results. Implementing countries adapt the forms and tools, as necessary, to meet their specific needs; however, the standard implementation calls for one indicator from each of five health programmes: maternal health, immunization, HIV/AIDS, TB, and malaria. A qualitative component, called the Systems Assessment, allows for the identification of weaknesses in the reporting system that contribute to data quality problems. The DQR implementation in Sierra Leone adhered nearly completely to the standard methodology; the only change was the substitution of the indicator, “currently on ART,” for “number of clients counselled and tested for HIV.” The resulting set of indicators for the DQR were:

- Maternal health – number of ANC 1st visits
- Immunization – number of third dose pentavalent vaccinations
- HIV/AIDS – number of clients counselled and tested for HIV
- Tuberculosis – number of notified TB cases
- Malaria – number of confirmed malaria cases

Data element completeness: The data on the forms should be complete to provide the full picture of service delivery at health facilities. For national level estimates, HIV and TB had the lowest data element completeness (83% and 82%, respectively). Maternal health, immunization, and malaria services all had data element completeness above 90%.

Data accuracy (verification factor): Perfect agreement between validated and reported values yields a verification factor (VF) of 1.0. Only TB had a VF greater than 5% discordance between validated and reported values (82%). VFs less than 1.0 indicate over-reporting of service delivery, whereas those above 1.0 indicate under-reporting. TB had therefore over-reported service delivery by approximately 18%. Much of this appeared to be at Community Health Centres (CHCs) (VF = 0.77, compared with 1.04 for hospitals). ANC 1st visit appeared to be under-reported by facilities in the Western region (VF = 1.22) as compared with other regions. Malaria cases appeared to be under-reported by hospitals (VF = 1.79) compared with other types of facilities. HIV counselling and testing had the highest degree of perfect matching between validated and reported results (78%), whereas malaria cases had the lowest degree of matching (39%). The Eastern region had the highest percentage matching (69% average across programme areas) among the regions, whereas Community Health Posts (CHPs) had the highest percentage matching among health facility types (71%).

Reasons for data discrepancies: The most commonly cited reason for discrepancy was arithmetic errors, followed by data entry errors. For *immunization services*, 43% of facilities reported no discrepancies, whereas 20% said that data entry errors were the cause of discrepancy. Seventeen percent (17%) of facilities cited arithmetic errors for discrepancies, and 18% cited incorrect data

compilation from source documents for the mismatch between source documents and reports. No discrepancies were reported by 44% of facilities for *HCT*. Arithmetic errors were cited most frequently (16%), followed by data entry errors (12%). Thirteen percent (13%) of sites reported incorrect indicator compilation as the reason for the discrepancy in *HCT* reporting. Thirty-two percent (32%) of *TB sites* reported no discrepancies; however, data entry errors and arithmetic errors were both cited as the cause of discrepancies in 21% of sites. Missing source documents or monthly reports were cited as a cause of inaccuracy at 11% of sites. Twenty-four percent (24%) of facilities providing *malaria services* reported no discrepancy, but 29% cited arithmetic errors as the leading cause of disparities between source documents and reports. Data entry errors were cited in 23% of malaria facilities, and 20% cited problems with indicator compilation as the cause. Just 3% reported missing source documents or reports as the cause for discrepancies.

The data at the *district level* were found to be of quite high quality, as evidenced by a VF of 100% for four of five indicators. Completeness of reporting was also high, nearly 100% for all indicators. As it often does, timeliness of reporting lags completeness, in the range of 84% to 86% across the indicators. The reasons for discrepancies generally followed the reasons reported for facility-level reporting, with data entry errors cited most frequently (33% for ANC and malaria), followed by arithmetic errors (10% each for *HCT*, *TB*, and malaria).

Indicator definition: Standard indicator definitions ensure that all sites are collecting comparable information. Between 70% and 80% of all health facilities in the sample reported using standard indicator definitions for all indicators. However, only 50% of sampled hospitals reported using standard definitions for the ANC 1st visit. Only 55% of sampled sites in the Southern region were found to have standard indicator definitions for ANC 1st visit. Oddly, only 51% of sampled urban *TB sites* reported using standard indicator definitions as compared with rural *TB sites*.

Data quality checks: Data quality checking is an important aspect of data quality assurance because errors are common but are easily prevented with sufficient vigilance. A routine process for checking the quality of submitted reports was present in 36% of sampled facilities. Hospitals were more likely to have such a process (73%) than CHCs (45%), CHPs (43%), or Maternal and Child Health Posts (MCHPs) (26%). Routine accuracy checks (that is, re-compilation of priority indicators by a supervisor for a given reporting period and comparison with reported values for the same period) are another practice that enhances data quality. Thirty-six percent (36%) of facilities in the DQR sample reported having such a practice at the facility. Again, hospitals were more likely to have this practice (73%) than CHCs, CHPs, or MCHPs (40%, 29%, and 38%, respectively).

Documentation, policies and supervision: Health facilities should maintain records of data quality control efforts so that they can track progress toward goals and objectives for improving data quality. Only 21% of sampled sites reported having a written documentation of the results of data quality checks, and only 13% of sites said that they had written policies to guide data quality control. Furthermore, 79% of health facilities reported having had a supervisory visit in the past six months.

Availability and adequacy of source documents: Source documents are where the results of service delivery are initially recorded. They include tally sheets, registers and forms. The metrics assessed were whether the forms were available, standardized, up-to-date, and the occurrence of stockouts of forms/tools. For the ANC register, 96% of sampled sites were judged to have the

ANC register available, and 87% of sites were using the standardized version of the register. Ninety-two percent (92%) had entries up to the current day, whereas only 30% of sites reported a stockout of the register in the past 12 months. Hospitals (50%) were less likely than CHCs (80%), CHPs (88%), and MCHPs (91%) to be using a standardized ANC register. Hospitals were also more likely to have had a stockout in the past 12 months (50% of sites).

Eighty-seven percent (87%) of sites reported having tally sheets available, and 86% of sites were using the standardized tally sheets. Seventy-nine percent (79%) of sites had entries in the tally sheets up to the current day, whereas only 20% of sites had experienced a stockout in the past year. Again, hospitals (71%) were less likely than their smaller counterparts (85% to 88%) to be using standardized tally sheets.

The following recommendations are offered to achieve improvements, informed by the results of the DQR:

- Refresher training of health workers on comprehension of indicators and data management.
- Prepare a data quality assurance protocol as a guideline for health workers at all levels.
- Strengthen supervision to include routine data quality checks.
- Invest in the review and printing of data collection tools, forms and registers to ensure no stockouts.
- Provide support to district health teams to monitor data timeliness and completeness and to facility staff to improve data tallying and entry.
- Continue to make investments for a standardized adoption of the District Health Information Software version 2 (DHIS 2) for routine reporting.

1.5 Desk Review

The DQR includes a desk review, which is an analysis of previously reported aggregate data for priority indicators in the health management information system (HMIS) (that is, the DHIS 2). The analysis evaluates the data for consistency, completeness, and the presence of anomalous values (that is, outliers). Select results were:

For domain 1 – completeness and timeliness of reporting: ANC 1st visit completeness was 98% for the period January to December 2016 and no district surpassed the 10% threshold for quality (i.e., was more than 10% different from the pre-defined standard of 90%). However, timeliness of reporting was measured at only 31%, with all districts (14) failing to meet a modest standard of 75% of monthly reports submitted by the deadline.

Completeness of indicator data measures the extent to which data that are expected to be reported on the monthly report appear in the appropriate cells in the monthly report. For ANC 1st visit, the data element completeness was 97%. For TB, “pulmonary TB cases” was used to assess the data element completeness. Two districts failed to reach the standard of 80% completeness for this indicator. For TB, only district level values were available to judge completeness. If the district value is missing, this indicates that no health facility in the district submitted results for the missing months (or the results were not input into DHIS 2).

In domain 2 – internal consistency: one extreme outlier was found on examination of the 12 monthly values for 2016 for ANC 1st visit. An investigation revealed a value for Koinadugu district

in June 2016 that was more than twice as large as any value reported by the district for the year. The malaria indicator, “Electronic Integrated Disease Surveillance and Response (EIDSR) – Malaria Tested Positive,” had one extreme outlier during the most recent previous complete year of data (October 2016 to September 2017). The outlier occurred in May in Port Loko district. The HIV/AIDS indicator, “received results and post-test counselling,” was found to have three monthly district values greater than three standard deviations from the mean.

For consistency over time for ANC 1st visit: the national result was 99%, indicating that the national value (aggregated over all districts) was just slightly less than what was predicated by the results from the previous three years. A consistent trend was also found for Penta 3, but pulmonary TB cases for 2016 were 13% less than predicted from the previous three years, primarily due to a steep decline in reported cases from Port Loko district.

For consistency between related indicators, Penta 3 was found to be consistent on evaluation of the “drop-out rate” from Penta 1 to Penta 3. ANC 1st visit was largely consistent with regard to Intermittent Preventive Therapy 1st Dose (IPT1) (only Kailahun District reported more IPT1 than ANC1 for the year 2016).

A system of data analysis and review should be instituted whereby programme and data managers meet on a regular basis (for example, quarterly) to review the data in the DHIS 2 to assess its completeness, timeliness, coherence, and consistency. Capacity at national and district levels in the use of the WHO Data Quality Review app in the DHIS 2 tool should be built for in-depth analysis of the quality of routine HMIS data.

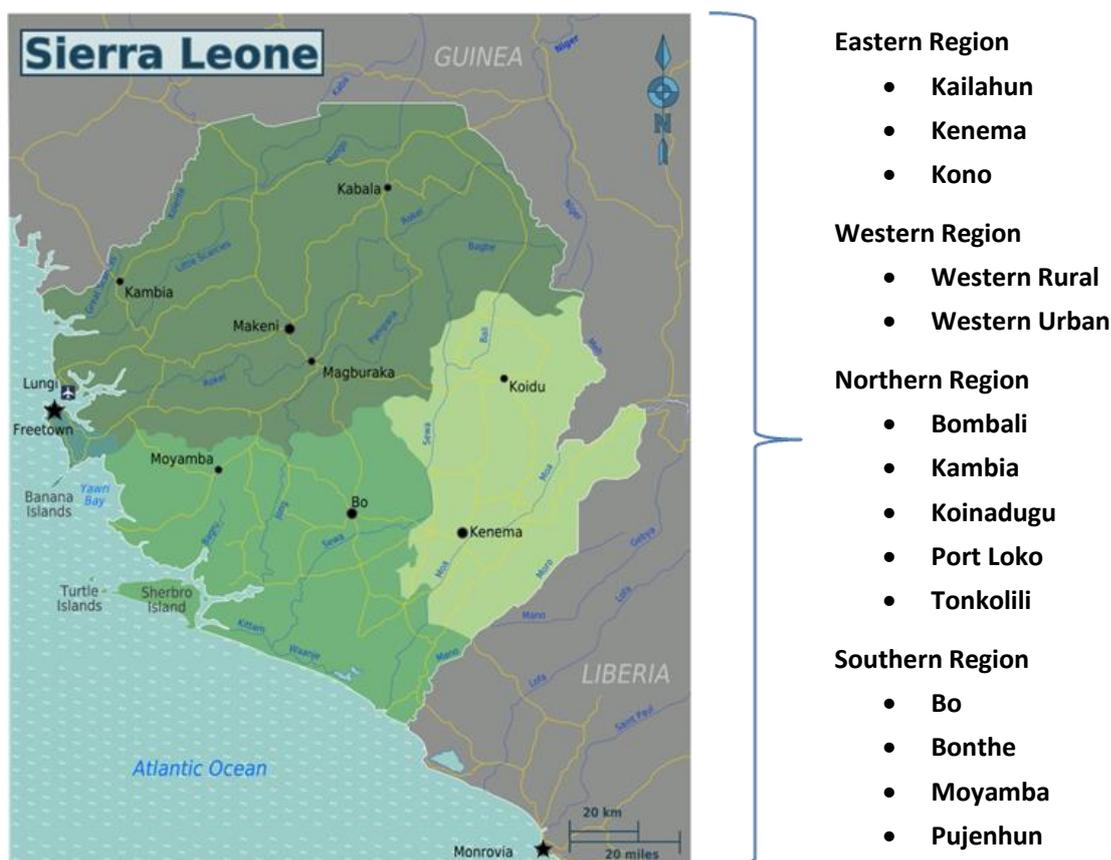
Chapter Two: Introduction

2.1 Geography, Demography and Governance

Sierra Leone is a small West African country of approximately 7 million people, bordered by Guinea, Liberia and the Atlantic Ocean. It recently celebrated its 56th year of independence, which the country gained from Great Britain in 1961 under the guidance of Sir Milton Margai, the first Prime Minister. Today, Sierra Leone is a constitutional republic, governed by an elected president and a single house of Parliament. The current President is Ernest Bai Koroma, who was elected in 2007 and re-elected to a second term in 2012. Presidential and parliamentary elections are planned for 2018.

The country is divided into four administrative regions: the Northern, Eastern and Southern provinces, and the Western Area, where the capital city of Freetown is located. Roughly 21% of Sierra Leoneans live in the geographically small Western Area; 35% in the Northern region; 23% in the Eastern; and 20% in the Southern (Fig. 1). These regions are subdivided into 14 districts and one area (Western Area). The districts are further subdivided into 152 chiefdoms, and the Western Area is subdivided into 12 wards. The Government of Sierra Leone (GoSL) has been attempting to devolve many functions to the district and chiefdom levels since the Local Government Act was passed in 2004, with mixed results across the various sectors. The country has roughly fifteen different ethnic groups. The official language is English, and most people also speak Krio, the most common local language.

Figure 1: Map of Sierra Leone



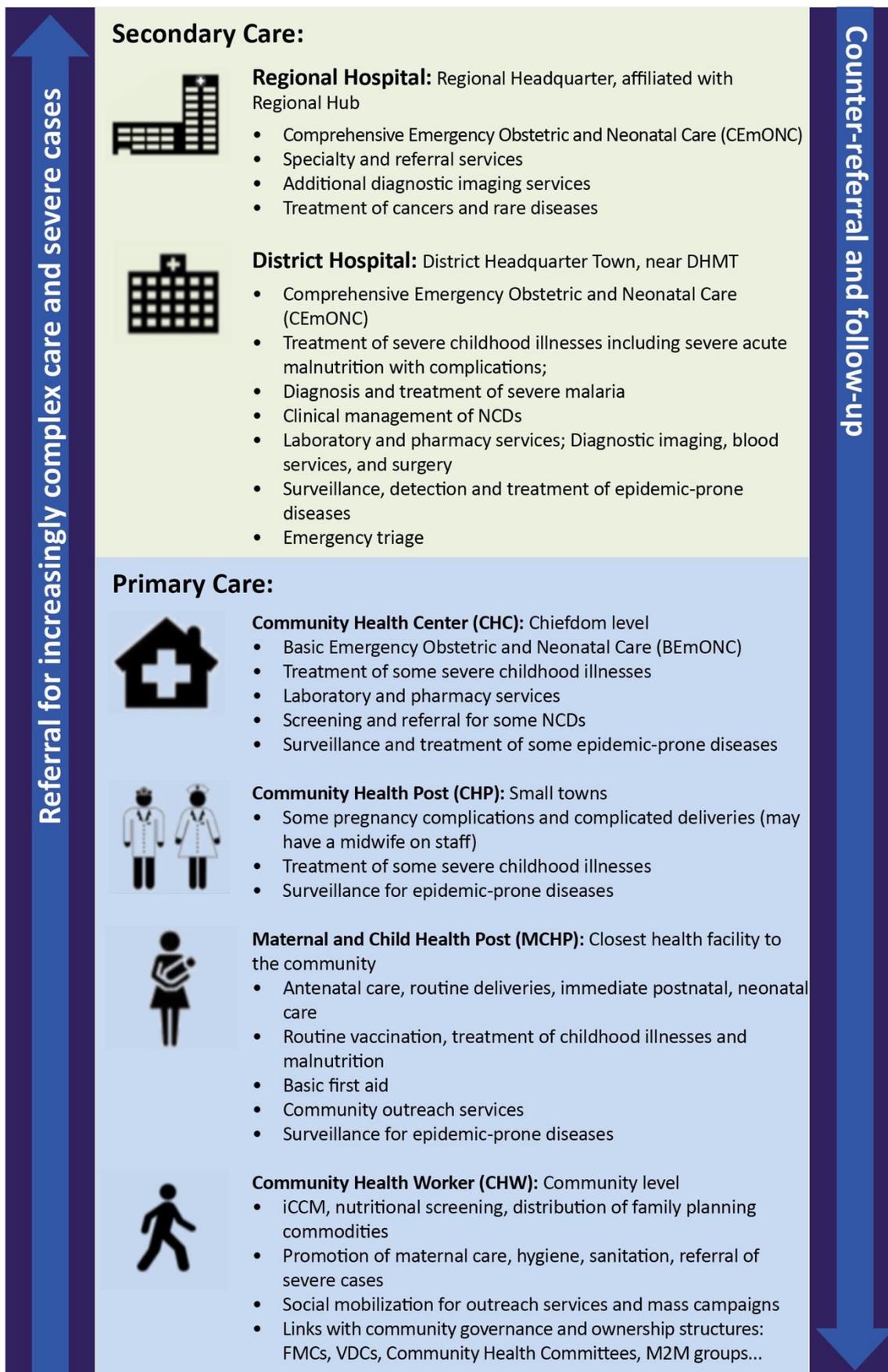
2.2 Overview of the health system

The health service delivery system has two tiers: the primary and secondary levels. The basic package of essential health services covers both levels. Primary health care is delivered at four levels of increasing clinical skill and ability to handle complications. Primary health care facilities are referred to as Peripheral Health Units (PHUs). There are three levels of PHUs: Maternal and Child Health Post (MCHP), Community Health Post (CHP), and Community Health Centre (CHC).¹ Each level has clearly defined functions. The buildings, equipment, drug supplies and staffing levels are specified to meet the functions. A limited range of preventive and basic curative services are also delivered directly at the community level (outside of health facilities but with linkages to PHUs through supervision, reporting, and supply chain management) (Fig. 2).

Secondary care is delivered at district hospitals. District hospitals receive referrals from primary care facilities and accept walk-in patients. The MOHS is in the process of establishing regional hub hospitals, at which additional specialized care will be available. District hospitals will refer complicated cases that they cannot manage to the regional hub hospital before moving to tertiary care. These levels and the package of services that should be available at each level are described in Figure 2. Sierra Leone has a limited number of public hospitals that are considered to be tertiary level facilities: Connaught Hospital, Ola During Children's Hospital, Princess Christian Maternity Hospital, Lakka, Kissy Mental, and Jui.

¹ Community Health Officers head the CHCs; Community Health Assistants head the CHPs; and Maternal and Child Health Assistants head the MCHPs.

Figure 2: Levels of care and hierarchy of health facilities by services provided



2.3 Why a SARA+?

Ebola drew global attention to the state of Sierra Leone's health system. The MOHS continues to make progress in building the resilience of the health system, leveraging gains made during the Ebola response. The country has completed the first phase of its health recovery plans (six- to nine-month health recovery plans) and has rolled out the next phase of plans (10- to 24-month health recovery plans and 24-month health sector operational plans). The plans are primarily targeted at reactivating primary health care services that were hitherto decimated by the epidemic, maintaining resilient zero (zero new Ebola infections) and rapidly reducing reproductive, maternal, newborn and child health (RMNCH) morbidity and mortality. The country has developed a National Health Sector Strategic Plan 2016-2021 to guide strategic investments.

Sierra Leone needs strong information systems to adequately track progress made and to inform decisions about the implementation of health care programmes as it implements its recovery and resilience plans. A challenge observed with the national health management information system (HMIS) is the quality of routine reports from health facilities and districts. They are often incomplete, overdue, of inadequate quality and subject to bias. It is imperative to systematically improve the quality of facility-generated data through a well-functioning routine HMIS, complemented by a systematic and periodic facility assessment of service availability and readiness, and a record review of selected indicators to fill data gaps and to verify the quality of routinely reported data. These reviews will inform progress, performance reports, programme planning and policy formulation.

The SARA provides essential information on service delivery by assessing and monitoring service readiness and capacity at district and health facility levels; assessing the equitable and appropriate distribution of services and resources; and providing the health sector with the skills and tools for monitoring service and resource availability on a regular basis. The SARA provides essential information on the status of the health system in terms of service accessibility (for example, density of health facilities and beds, core health workers, service utilization), and the readiness of facilities to provide an adequate level of service (for example, availability of trained staff, diagnostics, equipment and medicines) for both general health services and specific key health interventions (for example, maternal and newborn health, HIV/AIDS, TB, and malaria diagnosis and treatment).

In addition to the SARA, the MOHS assessed the quality of routine HMIS data (the Data Quality Review or DQR) and a QoC assessment of district and health facility management units. Hence, this SARA 2017 is called SARA *Plus* (SARA+).

2.4 Elements of the SARA+

2.4.1 SARA

A health facility census was used:

1. To determine the physical *availability or presence of quality health services*, encompassing the health infrastructure, core health personnel and aspects of services utilization.

2. To assess *service readiness*, in terms of general service readiness (presence of basic amenities, basic equipment, standard precautions for infection prevention, diagnostic capacities and essential medicines), and service-specific readiness (ability of health facilities to offer a specific service and their capacity to provide specific tracer items, such as trained staff, guidelines, equipment, diagnostics, medicines and commodities).

2.4.2 Quality of Care Survey

A health facility sample survey was used:

1. To assess the QoC provided at different facility levels, with a focus on HIV, TB, malaria, and reproductive and maternal health.

2.4.3 Data Quality Review

A health facility sample survey was used:

1. To assess the quality of health data documented in primary source documents in the health facilities.
2. To assess the accuracy and congruency between data in the primary source documents and summary monthly reports sent to district and national levels.
3. To assess the adequacy of data management capacity at facility and district levels.

2.5 Methodology of the SARA+

The SARA was conducted as a census of all health facilities in Sierra Leone. The current MFL was used as the default list for inclusion. Unique facility codes were generated with the structure [xx xx xxxx], the first two digits denoting **the region**, the **second two digits denoting the district**, and the **last four digits denoting the facility number**.

2.5.1 Adaptation of survey tools

WHO's SARA questionnaires, version 2017, were customized for Sierra Leone. Adaptation of the questionnaires was done during a three-day workshop using a consultative process to ensure that country-specific needs were included. The questionnaire was customized in CSPro, and the computer-assisted personal interviewing (CAPI) tool was configured on the tablet computers used for all data collection. Employing a modular approach, the SARA+ tools used structured questions and pre-coded responses to collect data. Six questionnaires were adapted: one SARA questionnaire included the overview of health facilities, general services availability, general readiness, and specific availability and readiness; four questionnaires for QoC covered HIV counselling and testing services, management of TB, malaria, pregnancy and childbirth; and there was one questionnaire for the DQR. The questionnaires were pilot tested in the Western urban and rural districts. The questions were adjusted based on the experience obtained during the pilot test.

2.5.2 Pre-testing of survey tools

As noted above, the MOHS undertook a pilot test of the survey instruments to evaluate results and make amendments to the final tools prior to rolling out the field data collection exercise countrywide.

2.5.3 Recruitment and training of survey field teams

Personnel included a survey manager, field supervisors, data collectors, data entry/processing officers and data analysts. They were recruited through open advertisement, application, interview and appointment processes. The Data Collector's Guide (DCG) was used as part of the key training materials for field teams. The DCG was designed to provide interviewers with the knowledge and skills needed to effectively conduct a health facility assessment. The primary objectives of the DCG were to:

- Introduce survey personnel to the SARA tool and the Facility Reporting Data Verification Tool (records review).
- Help personnel gain an understanding of the rationale for conducting a health facility assessment.
- Instruct personnel on how to conduct an interview and complete the questionnaires.
- Familiarize personnel with both paper-based and CSPro data collection methodologies.

The DCG was used to support and guide field survey team members in conducting the health facility assessments. The guide provided general instructions on the interviewing skills required; detailed explanations and definitions of specific questions to ensure a uniform understanding of the content; a consistent approach to recording results across different facilities; and instructions on how to collect data at a facility.

2.5.3 Survey logistics

Survey logistics covered the procurement of various items, including equipment and transport, taking into consideration the number of sites to be visited by the data collection teams, as well as drivers, vehicles and petrol. It also involved advance contact with authorities and facilities.

Prior to the fieldwork, the MOHS notified appropriate authorities at both national and subnational levels of the nature and purpose of the health facility assessment, and the required support from the field. Each team was given a copy of the letter to produce at the sites, if necessary.

2.6 Quality assurance

JSI recruited three public health professionals from the pool of data collectors for the SARA+. An additional staff person, a Monitoring and Evaluation (M&E) Officer from JSI's Advancing Partners & Communities Project, was selected to manage and oversee the data verification activity (also known as the "back check").

2.6.1 Site selection

Sites for the back check were selected randomly using the pseudo-randomization function in the Statistical Package for the Social Sciences (SPSS). A 5% sample of 1284 sites on the MFL amounted to a total of 65 sites. For the DQR and QoC assessment, a sample of 150 sites was selected from the health facility list. Therefore, a 10% sample was selected from among them for the back check, yielding 15 sites. The 15 sites for the back check of the DQR and QoC survey were a subset of the 65 sites selected for back checking the SARA core module.

Since the number of TB sites in the country were the fewest (among the programme areas selected for review), they were sampled first to ensure adequate representation. (Of 160 total TB sites in the MFL, 48 were sampled for the SARA+, and of these, 15 sites were selected for the back check.) All TB sites also offered HCT (according to the MFL information). It was further assumed that all sites offered maternal and child health, immunization, and malaria diagnosis and treatment services.

2.6.2 Data Capture

The back check team began its work about one week after the data collectors left for the field. Data were entered directly into the SARA2.2 application in CSPro on tablet computers. The data were then uploaded to a central server in Freetown, then compiled remotely by JSI.

2.6.3 Analysis

The initial back check of five sites (first two weeks of data collection) confirmed that the data were being recorded and transmitted correctly. The JSI team reviewed the data weekly during implementation of the SARA+ and sent compiled data files to survey managers at the MOHS for follow up. JSI used standard batch files in the SARA2.2 CSPro application to run analyses for completeness of data elements and to compare survey records to the “supervisor” record collected and entered by the back check team.

2.7 Quality of care survey

2.7.1 Sampling

The sample size was 10% of all facilities, stratified to include facilities that offered TB care, malaria treatment, HCT and ANC and delivery services. A total of 150 facilities were selected.

2.7.2 Record selection

The primary register was the default document for record review. For example, ten clients who signed up for ANC in the first trimester were identified from the ANC register. This register was also reviewed to determine the number of ANC visits made. The same client records were searched in the delivery and post-natal registers and reviewed for the relevant QoC parameters. Any client record that could not be reconstructed completely across the register chain was replaced by another client record. The same process was applied for the review of other services included in the QoC survey.

Enumerators: The personnel selected as enumerators for the QoC survey were medical doctors and senior nurses. They also doubled up roles as supervisors for the overall SARA exercise. A total of ten enumerators were selected and trained. Each administered the QoC questionnaire to an average of 15 health facilities.

There was no attempt to verify the accuracy of the documentation or to determine if actions (treatments and diagnostics) based on the information were appropriate. Rather, the objective was to identify whether routine patient clinical assessment and treatment protocols were followed, using the documentation as the evidence.

This is an important step in reinforcing the importance of documenting the patient care process and findings to promote continuity of care and to provide evidence for QoC. This documentation provides the information needed by service providers to assess changes in patient status over time, and information to inform decisions about whether the care process is effective, or potentially requires change. It also provides evidence of whether guidelines and protocols were being followed, and evidence that may support a decision not to follow a standard protocol.

Issues that may impact the use of record reviews to assess QoC are:

- Recording does not necessarily prove that a service was provided.
- The absence of recording does not necessarily mean that a service was not provided.
- Record reviews depend on service providers knowing what aspects of patient care are expected to be recorded.
- There must be a register or other database that provides the information for selecting a sample, and records must be available.

The advantages of assessing QoC using record reviews are:

- Record reviews do not depend on patients with a specific condition arriving on the day of the facility assessment. The records can be identified for services provided on another day.
- When it is known that QoC will be assessed using recorded evidence, this should improve documentation and management's reinforcement that documentation is expected.
- Documentation of key aspects of services provided allows for better continuity of care during subsequent visits, or when services are provided over several days (for example, inpatient services).
- Documentation provides evidence of actions taken, which strengthens accountability from service providers.

2.8 Data quality review

Complete information about the methodology for the DQR and the findings are provided in Section II of this summary report.

Chapter Three: General Service Availability

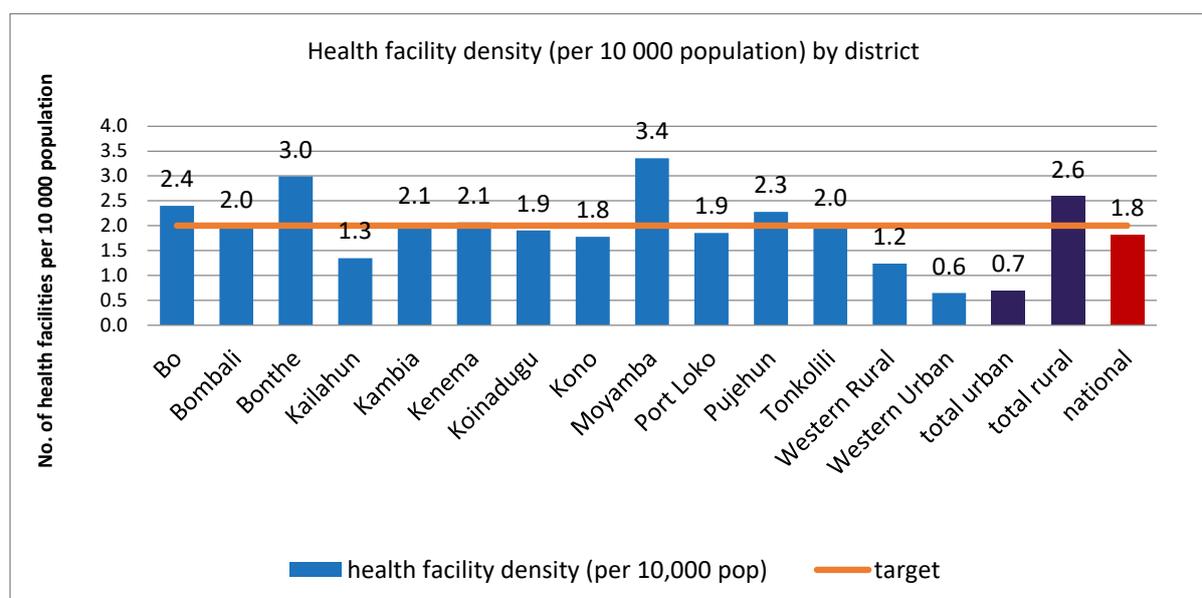
Service availability means the physical presence and distribution of health services for the population. Its domains are the health infrastructure, health workforce, and service utilization. General service availability is computed as the density of health services (outpatient and inpatient services) per unit population. Specific tracer indicators measure each domain:

1. Health infrastructure density
 - Health facilities per 10 000 population
 - Inpatient beds per 10 000 population
 - Maternity beds per 1000 pregnant women
2. Health workforce density
 - Core health workers per 10 000 population
3. Service utilization
 - Outpatient visits per person per year
 - Hospital discharges per year

3.1 Health facility availability

The MFL published in 2017 served as the main reference list for the SARA and the basis for determining the health facility density in the country. Sierra Leone has a network of 1284 public and private health facilities, including 54 hospitals, and is organized into three levels of care. In addition to the MFL, other data sources were used, including the HMIS, administrative data, and population projections.

Figure 3: Health facility density



Health facility density is an indicator of service access to outpatient consultations. Figure 3 shows that, on average, there were 1.8 facilities per 10 000 population. Eight districts (Bo, Bombali, Bonthe, Kambia, Kenema, Moyamba, Pujehun and Tonkolili) had a facility density at or above

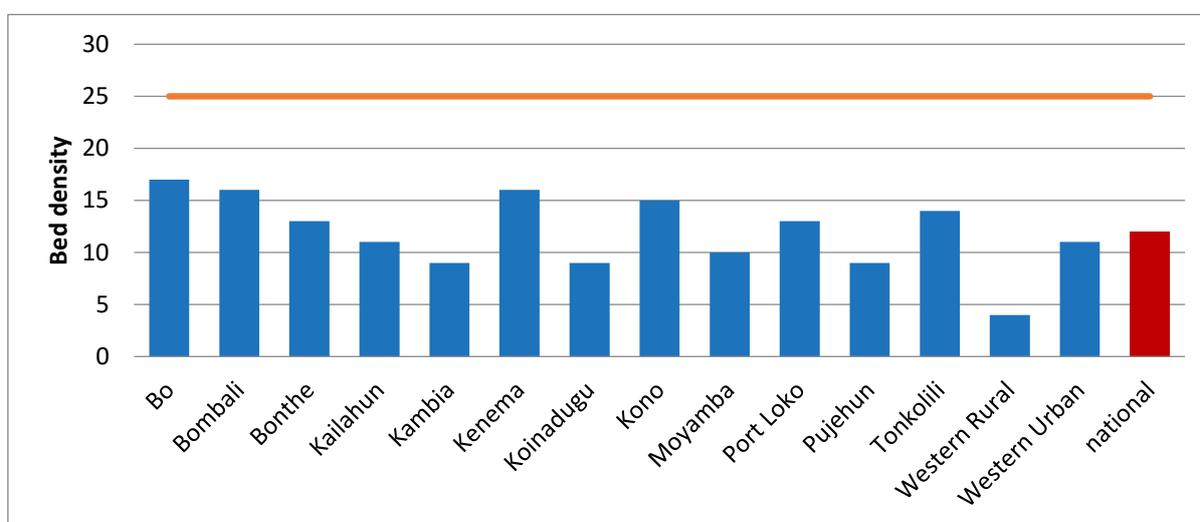
the recommended threshold of two facilities per 10 000 population. The Western urban and Western rural districts were lowest with regard to health facility density at the time of the assessment. The wide gap between urban and rural facility densities is notable, at 0.7 and 2.6, respectively.

3.2 Availability of health infrastructure

3.2.1 Inpatient bed density

Inpatient bed density measures the level of physical access of inpatient services by administrative level in the country. Figure 4 shows the status of inpatient bed density for the 14 districts and overall for the country. Sierra Leone has an average 12 inpatient bed density per 10 000 population. This is low compared with the recommended threshold of 25 inpatient beds per 10 000 population. All 14 districts had an inpatient bed density below the threshold level of 25 per 10 000 population. Findings ranged from 4 to 17 inpatient beds per 10 000 population for the Western rural area and Bo district, respectively.

Figure 4: Inpatient bed density per 10 000 population

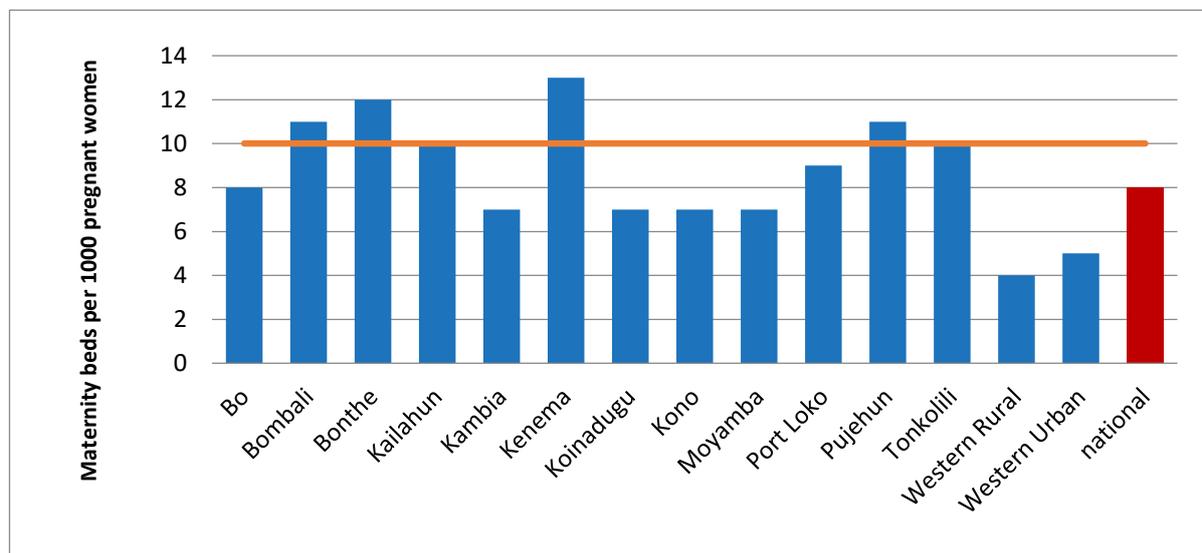


3.2.2 Maternity bed density

The availability of maternity beds is an important indicator of access to maternity services. Maternity beds are inpatient beds that are used exclusively by pregnant women before and after delivery. The data do not include delivery beds in the indicator.

Figure 5 shows that the overall maternity bed density was 8 beds per 1000 pregnant women, ranging from 4 in the Western rural area to 13 in Kenema district. Eight of the 14 districts were below the recommended level of 10 maternity beds per 1000 pregnant women.

Figure 5: Maternity bed density per 1000 pregnant women



3.2.3 Basic amenities

The assessment of basic amenities in the 14 districts was based on the following tracer items: power (grid or generator), improved water source, room with privacy, adequate sanitation facilities, communication equipment, access to computer with internet, and emergency transportation.

Figure 6: Proportion of health facilities with basic amenity items (N=1284)

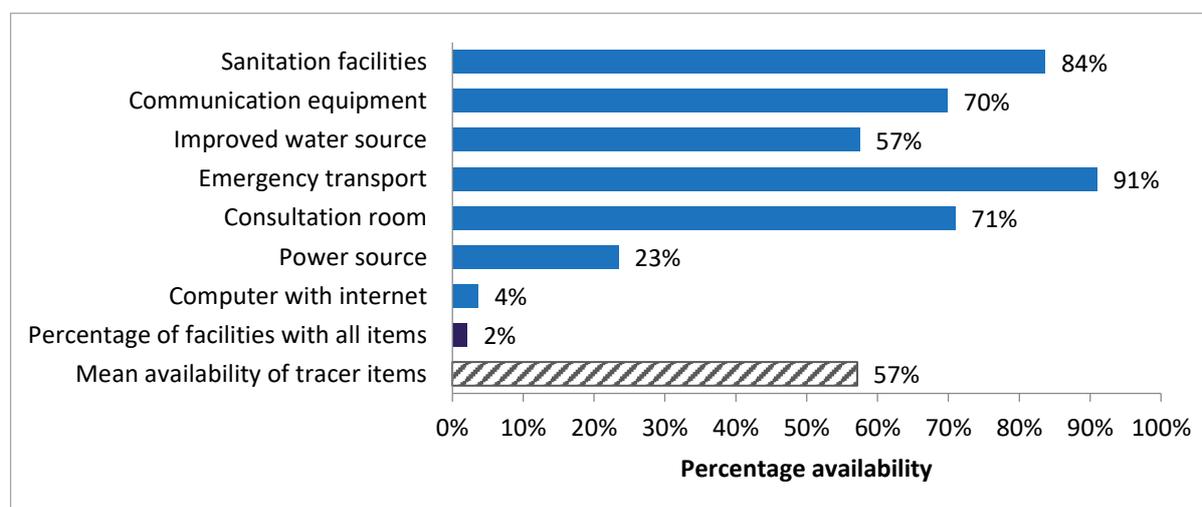
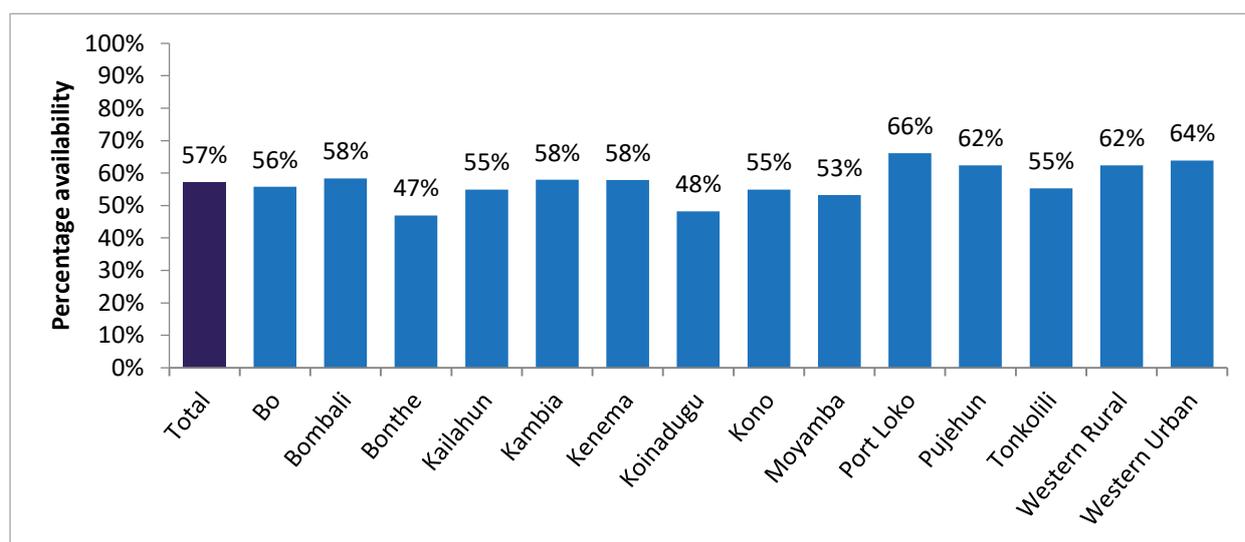


Figure 6 shows the percentage of facilities with tracer items available for basic health facility amenities. The overall mean availability of tracer items at all health facilities in the country was 57%. Emergency transport, sanitation facilities and communication equipment were available in 91%, 84% and 70% of facilities, respectively. Among all health facilities assessed, only 2% had all tracer items. Computer with internet and power sources were only available in 4% and 23% of health facilities, respectively.

Figure 7 shows the mean availability of basic amenity tracer items by district. This was computed by taking the mean availability of the basic amenity tracer items for each of the 14 districts. On average, the mean availability of tracer items ranged from 47% in Bonthe district to 66% in Port Loko district.

Figure 7: Mean availability of basic amenity tracer items, by district (N=1284)

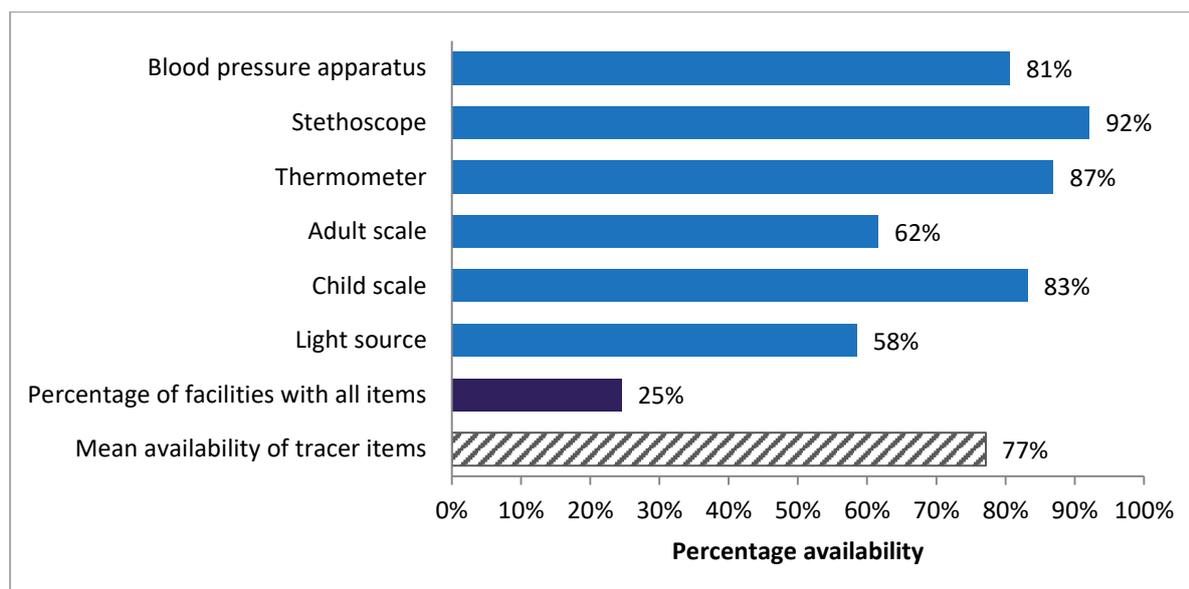


3.2.4 Basic equipment

The availability of basic equipment at health facilities was assessed based on the existence of the following items: blood pressure apparatus, stethoscope, adult scale, child scale, thermometer, light source, neonatal bag and mask.

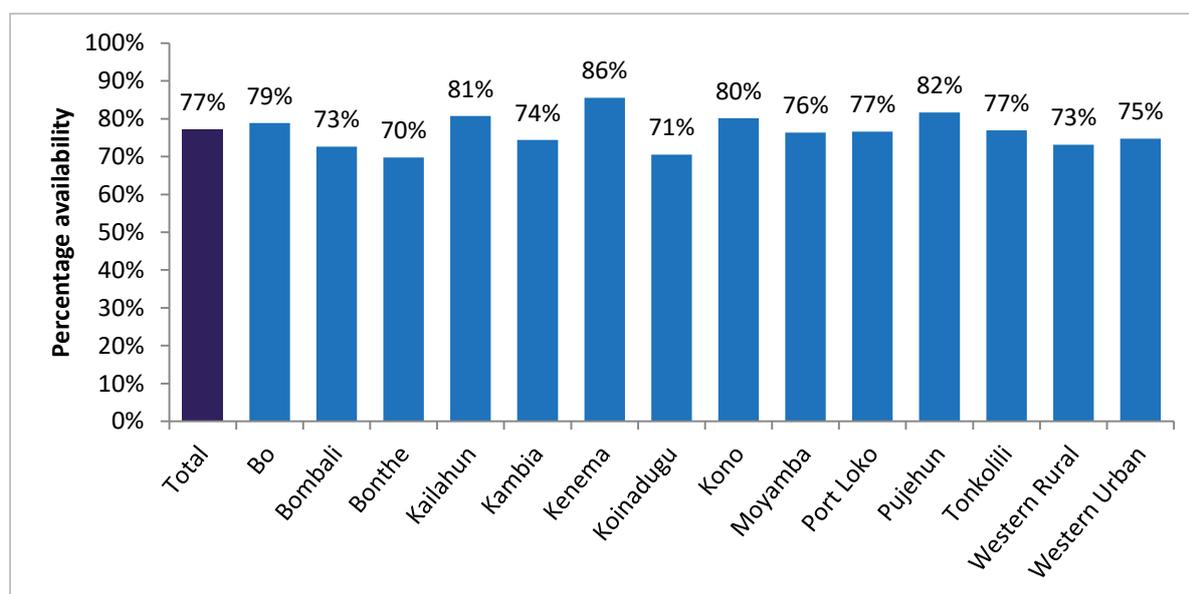
Figure 8 shows the percentage availability of basic equipment at the health facilities assessed. The availability of basic equipment tracer items was high at most facilities; more than 58% having a combination of any of the six tracer items. However, only 25% of health facilities had all tracer items at the time of the assessment. On average, health facilities had five of six tracer items, with an overall mean availability of 77%.

Figure 8: Proportion of health facilities with basic equipment for clinical consultations (N=1284)



For the six tracer items of basic equipment, the mean availability by district (Fig. 9) revealed that, on average, the districts had five of the six basic equipment items. However, for Bonthe and Koinadugu districts, the results were four of the six tracer items.

Figure 9: Mean availability of basic equipment, by district



3.2.5 Standard precautions for infection prevention

Standard precautions for infection prevention are key to ensure the implementation of infection prevention practices at health facilities. The percentage of health facilities with capacity and that were practicing infection prevention was assessed based on the following nine tracer items: safe final disposal of sharps; safe final disposal of infectious wastes; appropriate storage of sharps waste and of infectious water; disinfectant; single use disposable /auto-disposable syringes; soap

and running water or alcohol-based hand rub; latex gloves; and guidelines for standard precautions.

Figure 10: Proportion of health facilities with items for standard precautions for infection prevention (N=1284)

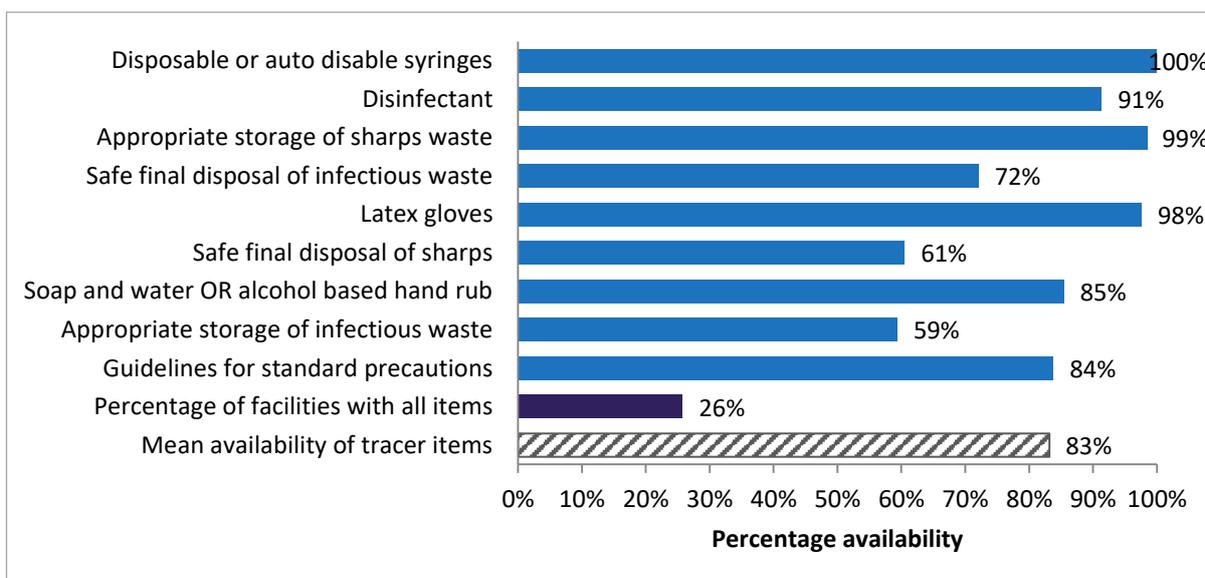
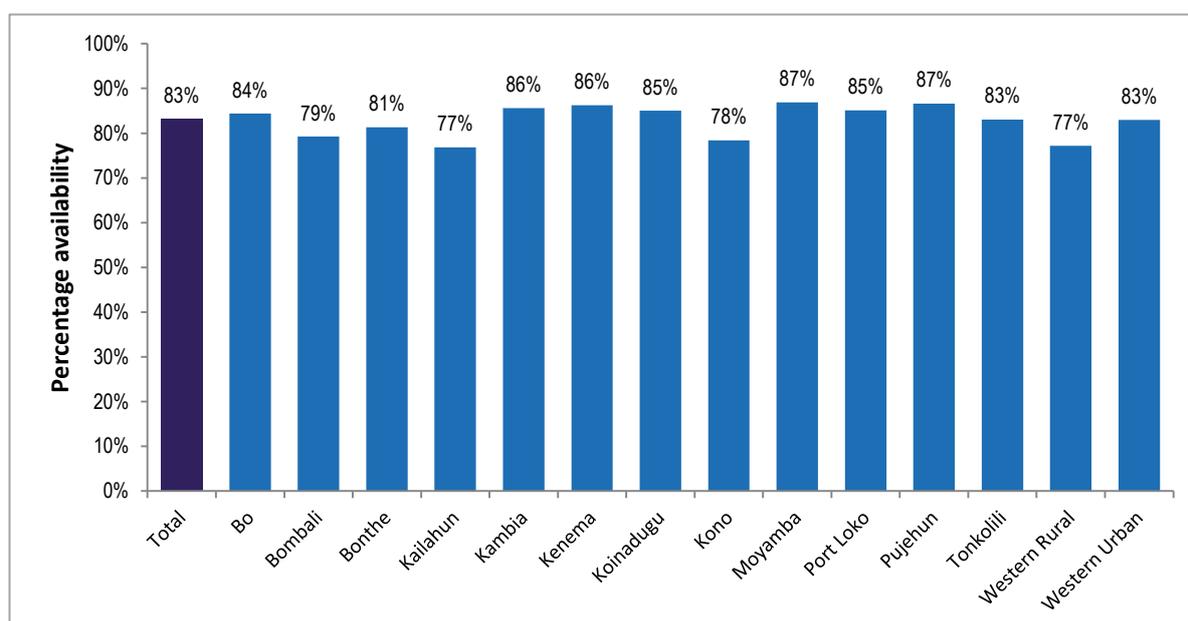


Figure 10 shows the percentage of health facilities with standard precautions for infection prevention practices. The majority of health facilities practiced the required level of infection prevention at the time of the assessment. The least practised standard precautions were storage of infectious wastes and safe disposal of sharps, at 59% and 61% of health facilities, respectively. The mean availability of the tracer items for standard infection prevention at the health facilities was eight of nine, amounting to 83%; however, overall, only 26% of health facilities practised all standard precautions for infection prevention. The mean availability of tracer items by district (Fig. 11) shows a score of 83% for all health facilities in the 14 districts

Figure 11: Mean availability of items for standard precautions for infection prevention, by district



3.2.6 General Service Readiness

The general service readiness index is a composite measure of the overall capacity of health facilities to provide the essential package of health services. It combines the mean availability indices or scores for the five domains: basic amenities, basic equipment, standard precautions, diagnostics, and essential medicines.

Figure 12 shows the general services readiness index for the 1284 health facilities in the country, and the five domain-specific scores. The measure helps summarize the status, compare results among districts, and compare trends over time and with countries in the same region. The general service readiness index for the 2017 SARA was 56%. Among the five domains, the mean scores for standard precautions and basic amenities were the highest (83% and 77%, respectively), and the mean scores for diagnostics and essential medicines were the lowest, at 33% and 31%, respectively.

Figure 12: General service index and domain scores (N=1284)

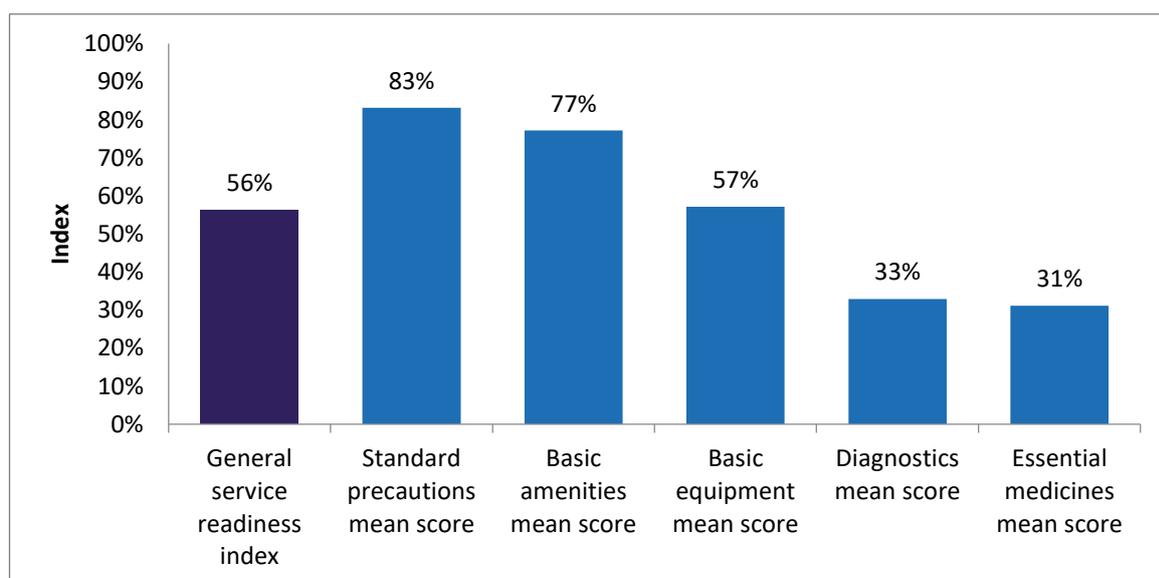
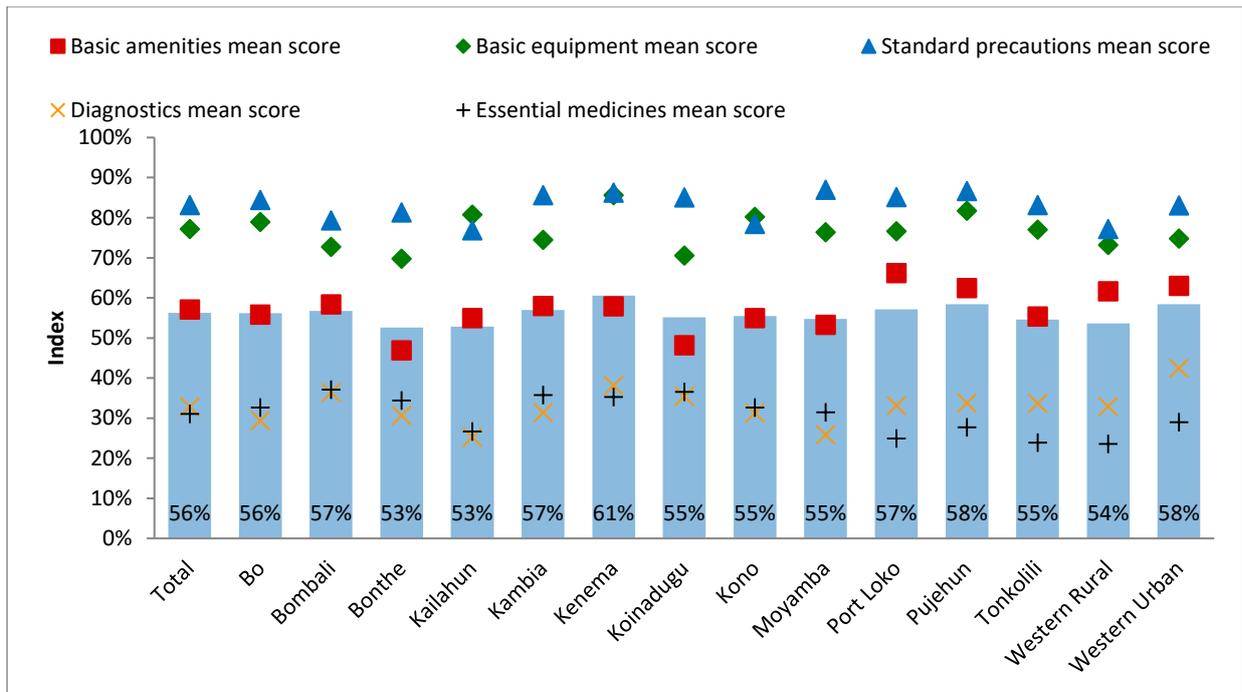


Figure 13 compares the general service readiness scores and domain-specific scores across the 14 districts. The general service readiness index was almost the same across the districts. The readiness scores for standard precautions and basic equipment were relatively good in all districts, including rural and urban, whereas the districts had lower availability of essential medicines and diagnostics.

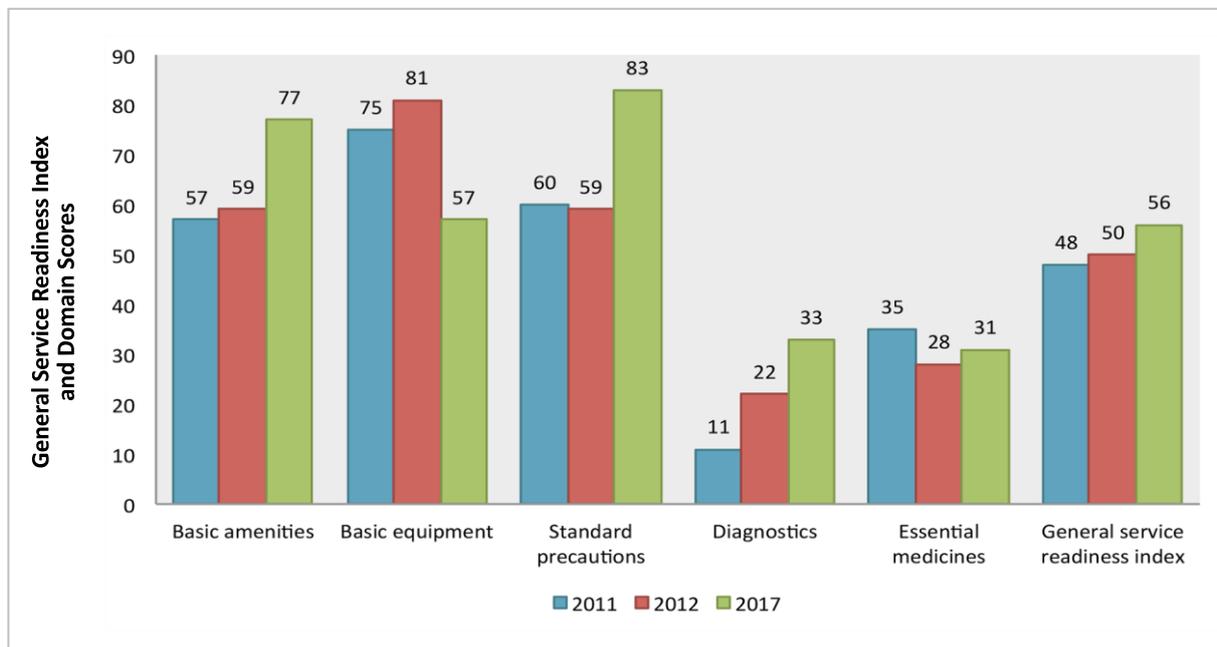
Figure 13: General service index and domain scores, by district



3.2.7 General service readiness time series analysis: 2011, 2012 and 2017

A comparison of the general service readiness index and domain scores (Fig. 14) across the years 2011, 2012 and 2017 reveals that the scores improved from 48% in 2011 to 56% in 2017. Basic amenities and standard precautions markedly improved over the years. However, the scores for diagnostics and essential medicines remained the lowest, albeit stable over the three time periods, and require serious attention.

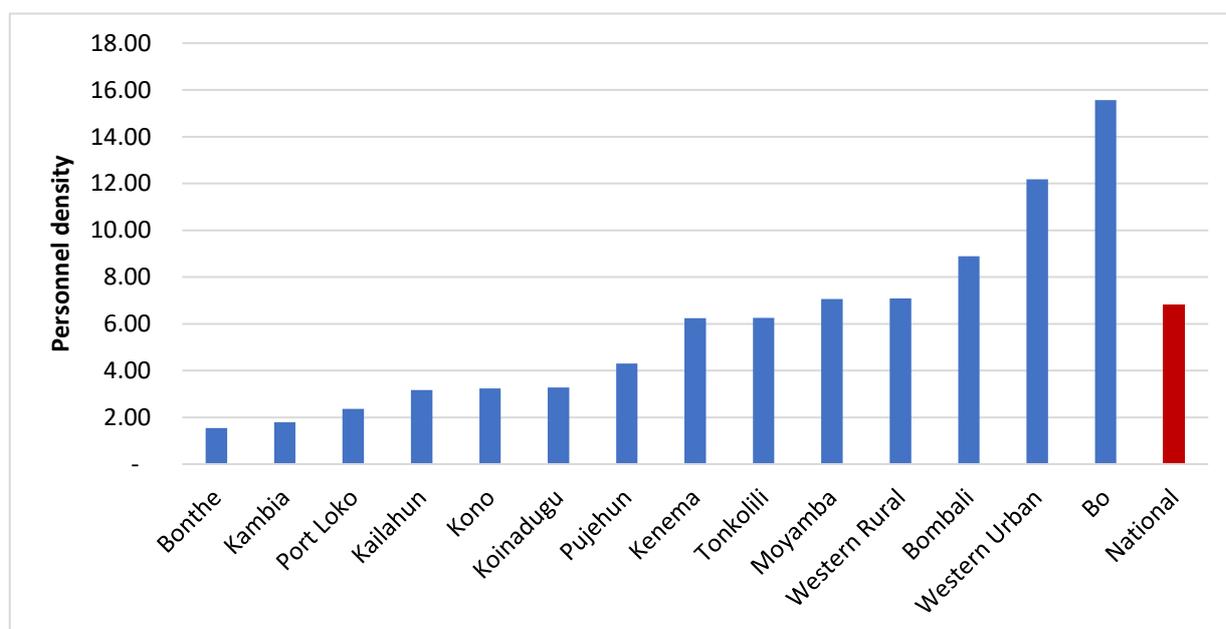
Figure 14: General service readiness and domain trends, 2011, 2012 and 2017



3.3 Health workforce availability

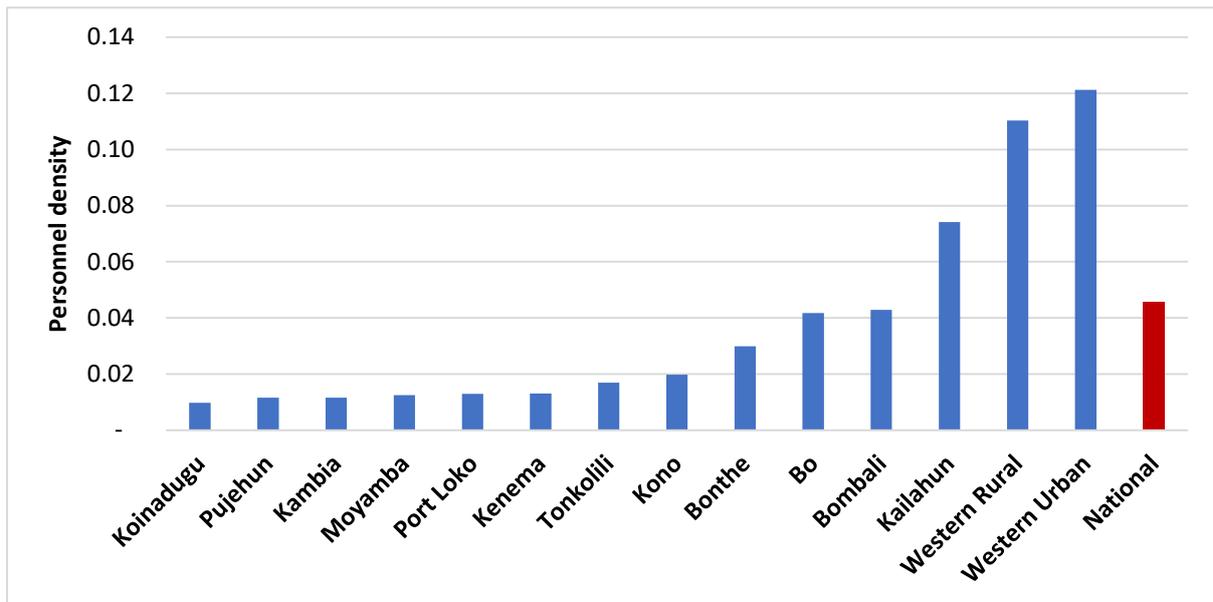
The availability of core health workers is a key component of the essential package of health services. An imbalance of health workers, in terms of absolute scarcity and maldistribution across the districts, including rural and urban distribution, significantly impacts access to and the quality of health service delivery. At the time of the assessment, Sierra Leone had a workforce of 4826 skilled health workers: 323 physicians, 389 Community Health Officers, 3185 nurses, 402 midwives, 41 pharmacists, 30 nutritionists and 456 laboratory technicians. The core health workforce density indicator puts a spotlight on these essential medical professionals. On average, countries require a minimum of 23 core health workers per 10 000 population to achieve adequate coverage rates for the essential primary health care interventions. In Sierra Leone, the skilled health worker density was 6.40 per 10 000 population (Fig. 15). The distribution of health workers was skewed: urban districts had a higher density of health workers compared with rural districts.

Figure 15: Skilled health worker density per 10 000 population (N=4826)



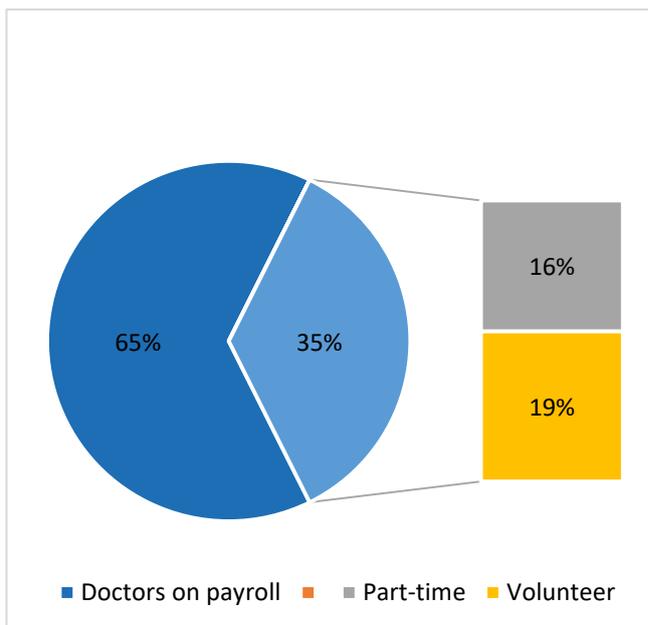
In 2010, WHO estimated that the physician density in Sierra Leone was 0.024 per 1000 population. This SARA+ 2017 report estimated the physician density at 0.05 per 1000 population. Figure 16 shows the distribution of physicians by district.

Figure 16: Physician density per 1000 population



It should be noted that eleven districts were below the national physician density of 0.05 per 1000 population. The absolute number of physicians and their distribution across the country are a two-pronged challenge that should be addressed.

Figure 17: Distribution of doctors by employment status

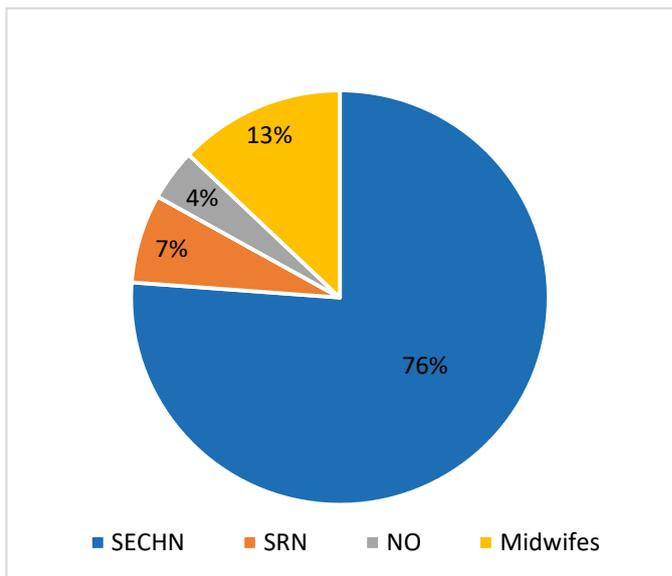


There was a total of 323 general and specialist doctors in the country. It is notable that 35% were not formally employed. They offered their services either on a part-time basis, paid by the facility management or a nongovernmental agency, or on a volunteer basis. Sixty-five percent (65%) were formally employed by the government (Fig. 17).

Nursing staff are critical to the strength of the health system. They are the frontline workers responsible for the delivery of primary health care, and for overall support of service delivery. SARA+ 2017 found a total of 3185 nurses providing services across the country.

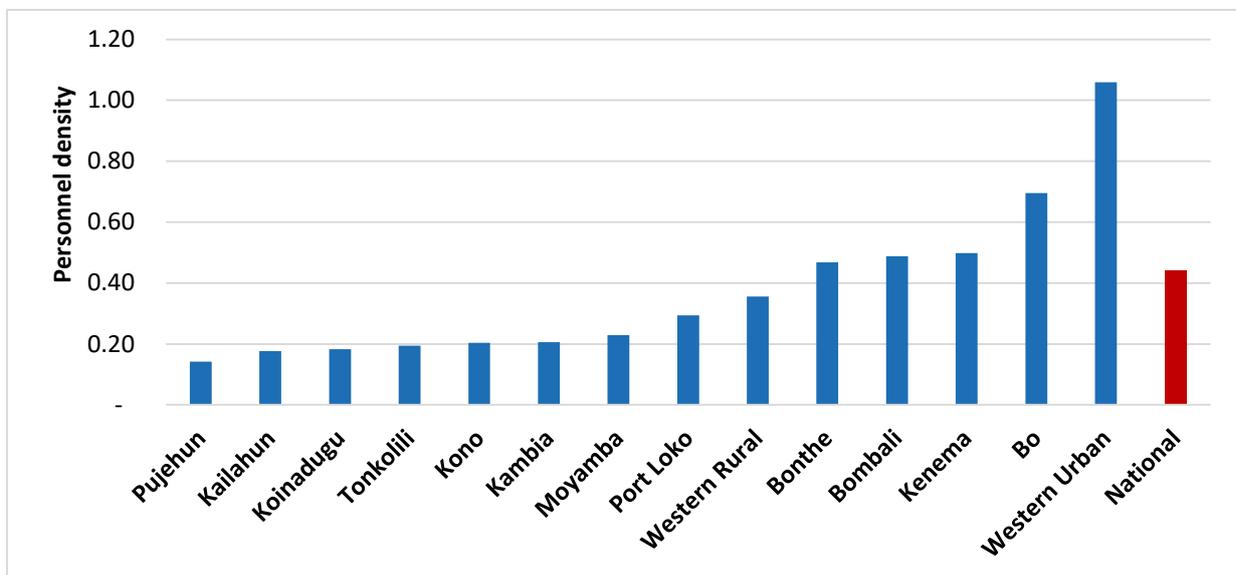
Most nurses (76%) were state-enrolled community health nurses (SECHN), 13% were midwives, 7% were state-registered nurses (SRN) and 4% were nursing officers (NO) (Fig. 18).

Figure 18: Distribution of nursing staff, by cadre



There were wide differences in the nurse density per 1000 population at the district level. Pujehun had the lowest density, at 0.14 per 1000, and Western urban district had the highest density, at 1.06 per 1000 (Fig. 19). Nine districts were below the national nurse to population ratio of 0.44 per 1000.

Figure 19: Nurse and midwife density per 1000 population



3.4 Availability of health products and commodities

3.4.1 Essential medicines

The availability of essential medicines is a key ingredient for the delivery of the essential package of health services. The essential medicines domain consists of 24 tracer items covering the package of essential services and programmes.

Figure 20: Availability of essential medicines (N=1284)

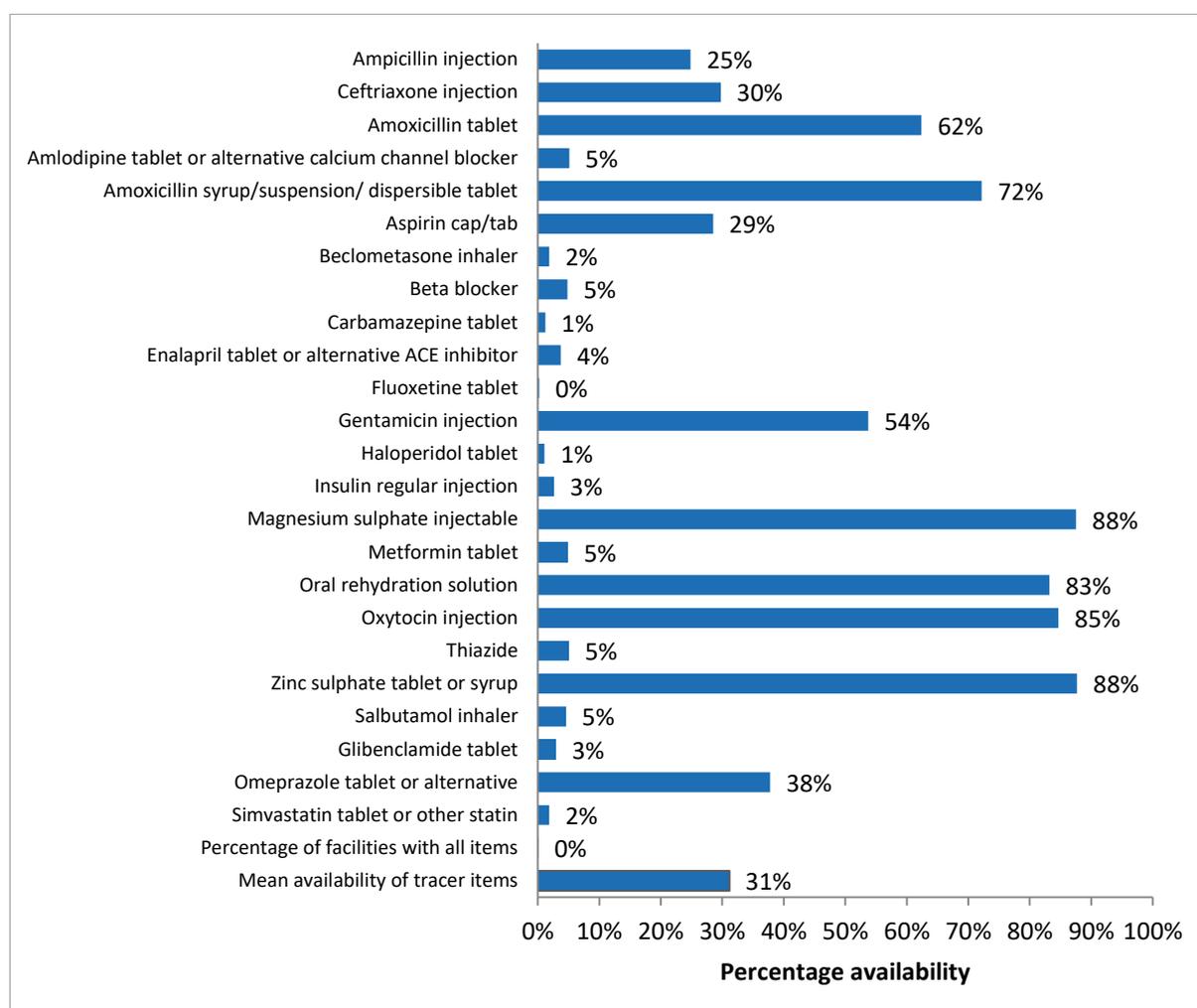


Figure 20 shows the percentage of health facilities with essential medicines items available at the time of the assessment. Magnesium sulphate injectable, zinc sulphate and amoxicillin were the medicines most commonly available at health facilities (88%, 88% and 72%, respectively). Other items, such as fluoxetine, carbamazepine and beclometasone inhaler, were among the essential medicines with the lowest stock. None of the health facilities had all items available at the time of the assessment. However, the mean availability of essential medicine tracer items was 31%, inferring that, on average, only six of the 20 items were available at the health facilities. In general, the mean availability and distribution of essential medicines by district were low, ranging from 24% in Tokolili district to 37% in Bonbali and Koinadugu districts. On average, the 14 districts had seven of the 20 essential medicines needed to deliver services (data not shown).

3.5 Availability of diagnostic services

Diagnostic capacity is key for health facilities to offer services. During the SARA+, health facilities were assessed on their capacity to conduct the following eight diagnostic tests on site: haemoglobin, blood glucose, malaria diagnostic capacity, urine dipstick for protein, urine dipstick for glucose, HIV diagnostic capacity, syphilis rapid diagnostic test (RDT) and urine pregnancy test

Figure 21: Percentage of health facilities with tracer items for diagnostic capacity (N=1284)

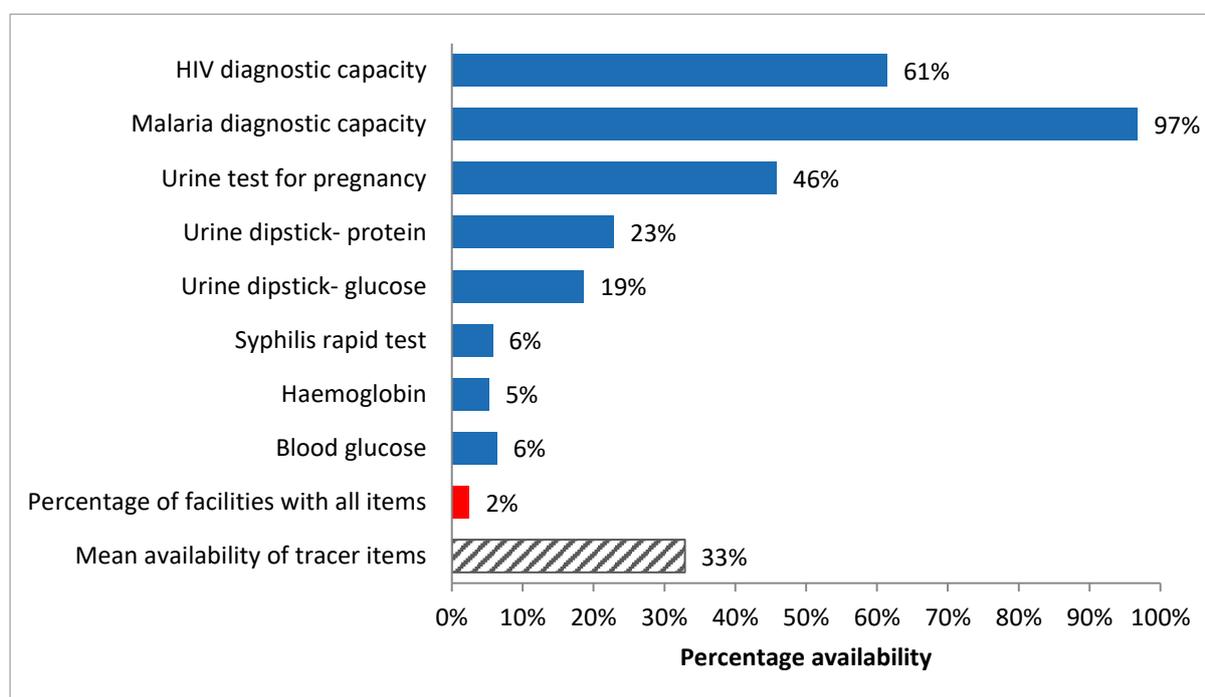
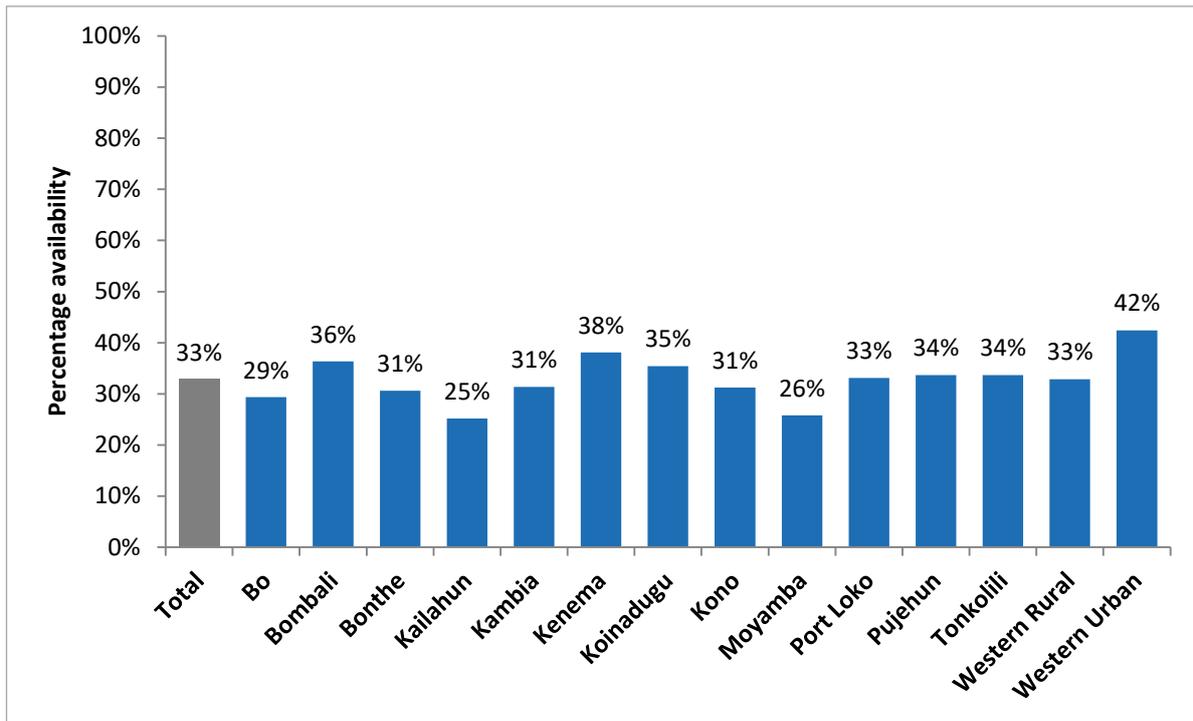


Figure 21 shows that the availability of malaria testing was the highest; 97% of health facilities were able to conduct the test. HIV testing was the second most commonly available diagnostic test, at 61% of health facilities. The urine test for pregnancy was available in approximately one-half of the facilities. The least available diagnostic tests were syphilis rapid test, haemoglobin and blood glucose tests. Diagnostic capacity was generally low.

Overall, only 2% of health facilities could conduct all eight tests (Fig. 21). On average, health facilities in the country could conduct three of the eight tests, for an overall mean availability of tracer items of 33%.

The mean availability of diagnostic capacity by district (Fig. 22) shows that the availability of diagnostic testing capacity was generally low in the 14 districts. Kailahun and Moyamba districts had the lowest diagnostic service capacity, with only two of the eight diagnostic tests available.

Figure 22: Mean availability of diagnostic capacity, by district



Chapter Four: Specific Service Availability and Readiness

4.1 Reproductive Health

The second phase of the Sierra Leone President's Recovery Plan prioritised saving the lives of 600 women and 5000 children in 2016. Concerted efforts are ongoing to scale up programmes aimed at saving the lives of women and children. Maternal death reviews, improved mortality data collection, health care worker training and improved emergency triage and response are some of the interventions in place. The expectation is to effectively decrease maternal and child deaths. This remains a priority in 2017 and beyond. Findings on the availability of maternal, newborn, child and adolescent health (MNCAH) services follow.

4.1.1 Family planning

Figure 23: Percentage of health facilities offering FP services (N=1284)

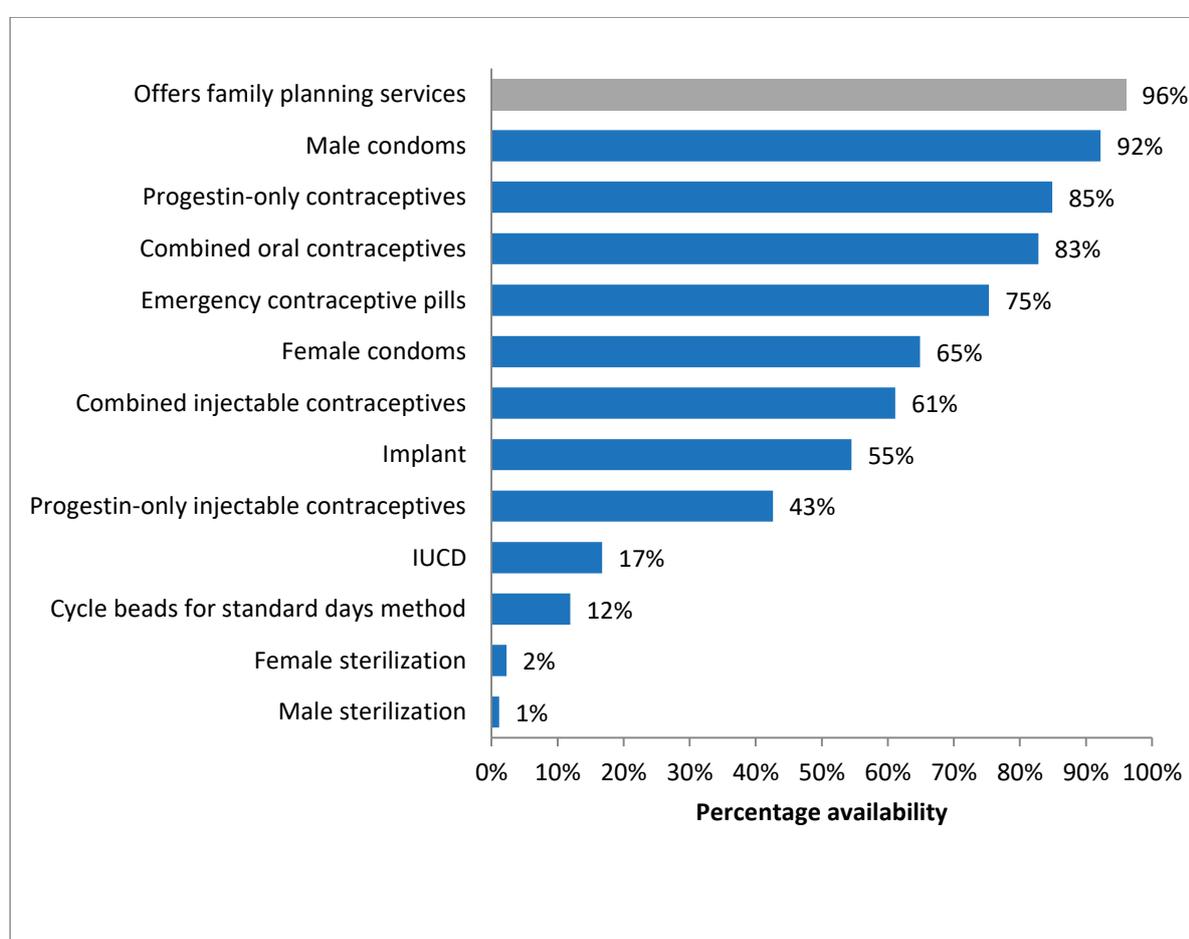
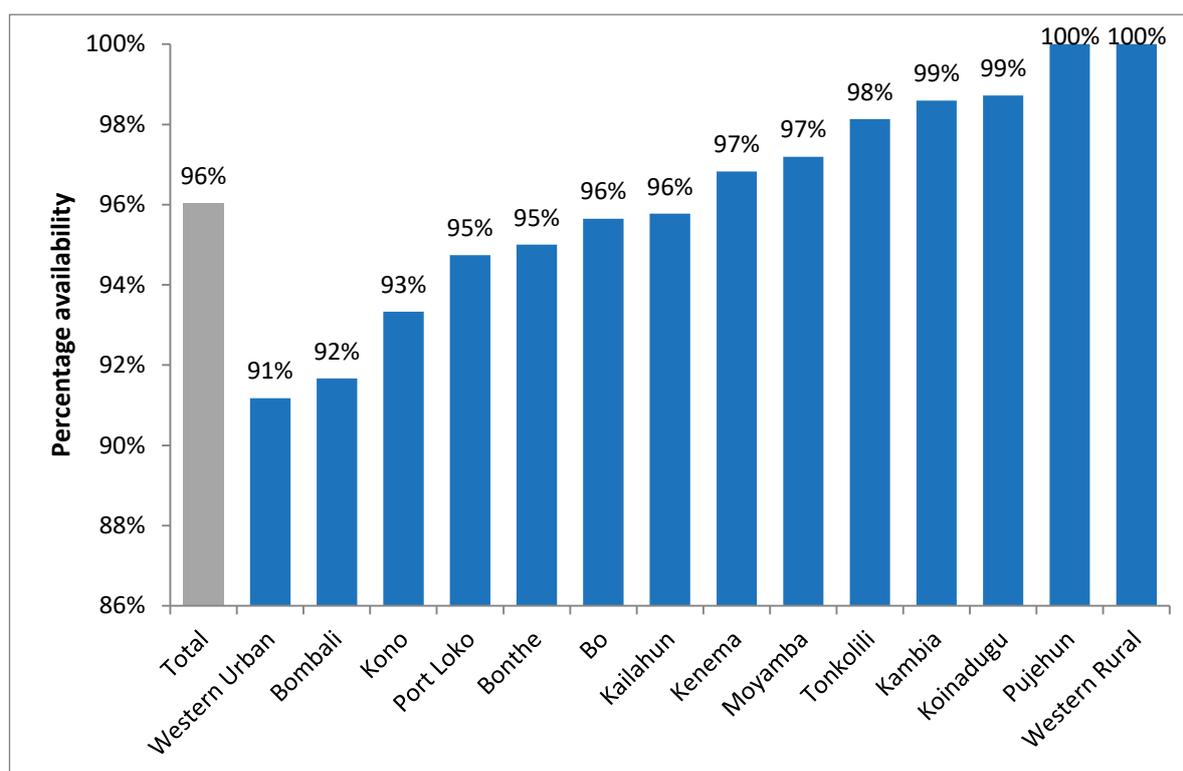


Figure 24: Percentage of health facilities offering FP services, by district



A majority of the 1284 facilities (96%) reported offering FP services. The main FP method available was the male condom, followed by oral contraceptive pills (Fig. 23). Female condoms and injectable contraceptives were available in just over 60% of the facilities. It is notable that surgical FP methods were rare. IUCD insertion was available at only 17% of the facilities, tubal ligation at 2%, and male sterilization at 1% of facilities.

The availability of male condoms and oral contraceptive pills as FP methods was high across all districts. Over 90% of facilities reported their availability. Western urban, Bombali, Kono, Port Loko and Bonthe had between 5% and 10% of facilities that did not offer any FP services (Fig. 24).

FP service readiness: Readiness scores for FP services were high (over 70%) in all districts except Western rural and Western urban districts (Fig. 25). The tracer items assessed were the availability of FP guidelines, job aids and staff trained in FP services; blood pressure machine; and FP commodities. Although the readiness scores were high across the districts, only 17% of facilities had all FP tracer items. FP commodities were generally available; between 70% and 90% of facilities offering services reported having FP stock. More attention should be paid to training staff and making FP guidelines and job aids available. The lowest score for staff trained in FP was 44% in Western rural district, and the highest score was 83% in Kenema district.

Figure 25: Percentage of health facilities with tracer items for FP services, by district

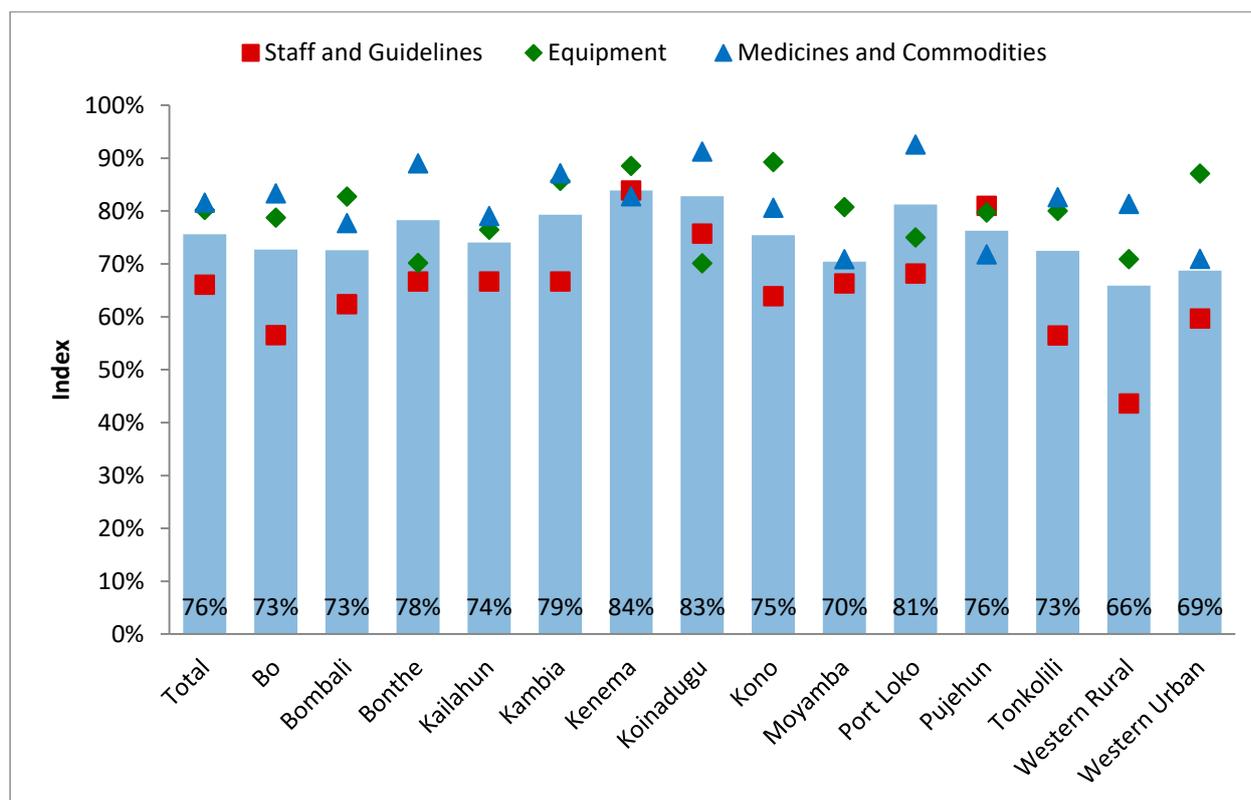


Table 1: FP commodities stockouts three months prior to the survey

	Female condom stockout	Implants stockout	Emergency contraceptive stockout	Total number of facilities
Facility type				
Hospital	42%	24%	42%	33
CHC	34%	25%	38%	224
CHP	40%	29%	41%	325
MCHP	31%	20%	30%	624
Clinic	48%	26%	48%	27
Managing authority				
Government/Public	35%	24%	35%	1191
Private	31%	12%	43%	42
Urban/Rural				
Urban	48%	20%	40%	172
Rural	32%	24%	34%	1061
Total*	34%	24%	35%	1233

* Limited to facilities offering FP services; 4 facilities could not be classified by type.

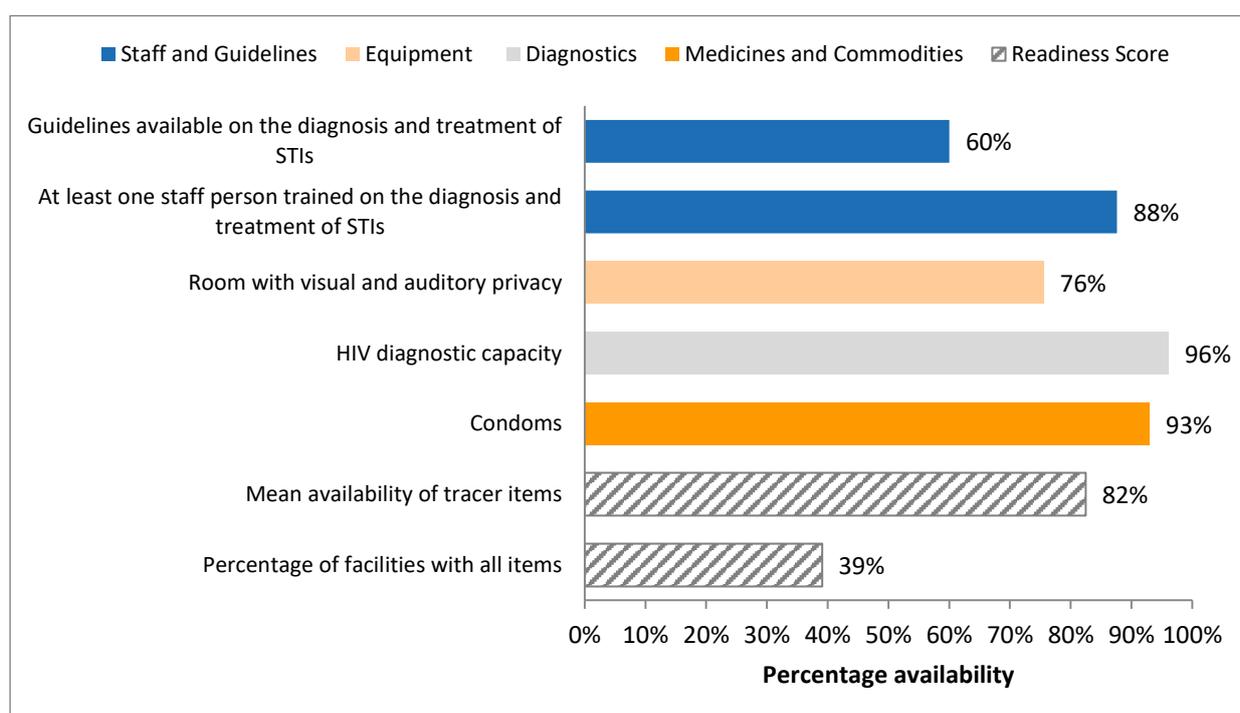
FP commodity security is critical to improving service utilization. The availability of male condoms was high in almost all facilities visited. However, female condoms were rarely available. On average, one in every three health facilities visited reported stockouts of female condoms in

the three-month period prior to the survey (Table 1). Although emergency contraceptives were heavily prescribed, they had the highest stockouts across all facility types. Interestingly, whereas only 55% of facilities reported offering implants (Fig. 23), implants stockouts were the least reported across all facility types.

4.1.2 Sexually transmitted infections

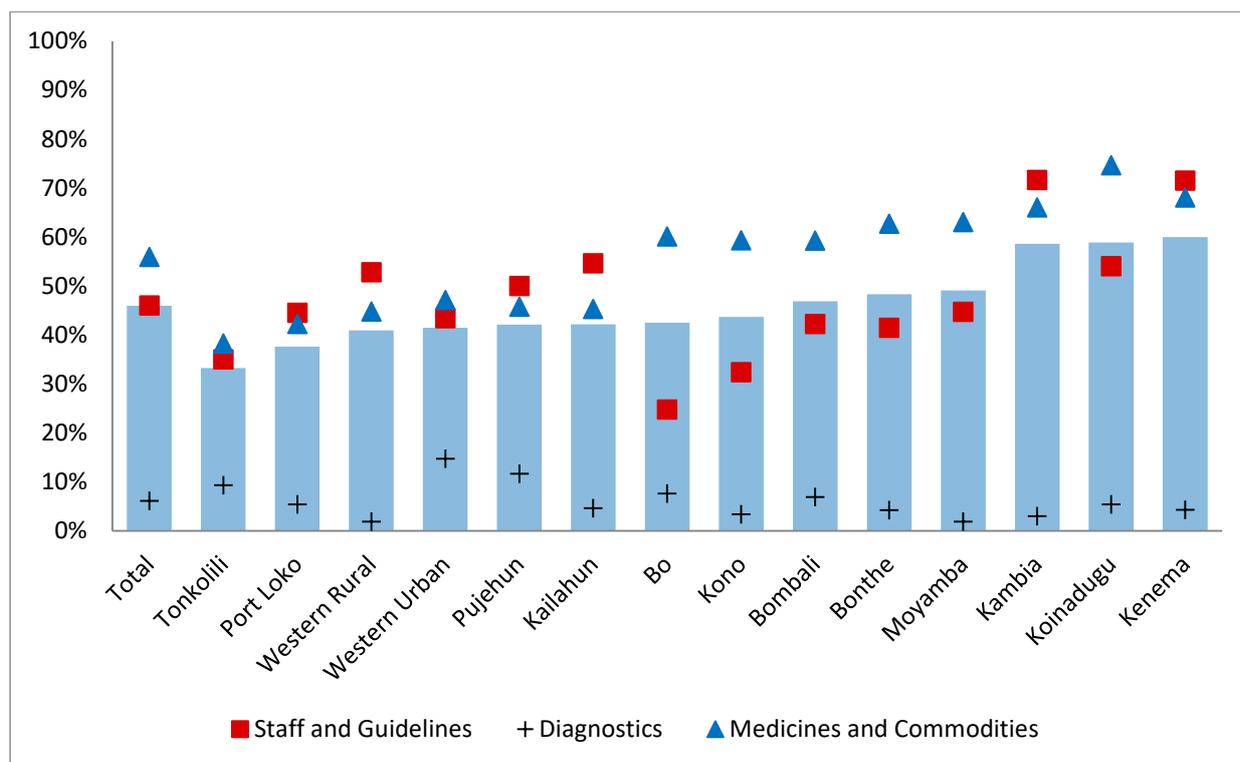
Readiness for provision of sexually transmitted infection (STI) services: The readiness score for the provision of STI services was below 50% for the 1195 facilities that offered the service. The greatest limitations to adequate readiness were the availability of staff trained on the treatment of STIs (48%), the availability of guidelines for diagnosis and treatment of STI (45%) and the availability of laboratory tests (6%) (Fig. 26). Two of every three facilities offering STI services did not have injectable and oral antibiotics for the treatment of STIs.

Figure 26: Percentage of health facilities with tracer items for STI services (N=1195)



The readiness score for STI services across the districts ranged from 33% to 60% (Fig. 27). Health facilities offering STI services were compromised by an inability to provide STI diagnostic services. Less than 15% of facilities across all districts had STI diagnostic services. In ten districts, less than 50% of facilities that offered STI services had trained staff and STI diagnosis and treatment guidelines.

Figure 27: Percentage of health facilities with tracer items for STI services, by district



4.2 Maternal and Neonatal Health

4.2.1 Antenatal care

ANC services are available at all primary health facilities (CHCs, CHPs and MCHPs) (Table 2). One of every three hospitals and one of every five clinics reported not having ANC services available. A possible explanation is that these are specialised hospitals, and they therefore did not offer ANC services. About 25% of facilities not providing ANC services were private facilities and were most likely in an urban setting.

Table 2: Percentage of health facilities offering ANC services, by type and ownership

	Offers ANC	Iron supplementation	Folic acid supplementation	Intermittent Preventive Therapy in Pregnancy	TT vaccination	Monitoring for hypertensive disorder of pregnancy	Total number of facilities
Facility type							
Hospital	66%	66%	63%	61%	59%	66%	56
CHC	100%	96%	93%	96%	99%	99%	224
CHP	99%	97%	97%	96%	95%	98%	328
MCHP	100%	97%	94%	93%	97%	98%	629
Clinic	77%	74%	70%	72%	64%	74%	47
Managing authority							
Government/Public	99%	96%	94%	94%	96%	98%	1203
Private	74%	72%	68%	72%	62%	73%	81
Urban/Rural							
Urban	89%	85%	79%	84%	84%	88%	200
Rural	99%	96%	95%	94%	96%	98%	1084
Total	97%	94%	92%	92%	94%	96%	1284

The availability of ANC services across the districts was high, with a mean service availability of 97% (Table 2). Almost all facilities provided ANC services. Western urban district had the lowest service availability, at 91% (data not shown). It was also the district with the highest number of specialised hospitals that did not offer ANC services.

ANC service readiness: The mean readiness score for ANC service was 66% (Table 3), denoting the proportion of facilities assessed as having the varying combinations of the ANC tracer items. The lack of availability of ANC diagnostics was notable (Fig. 28). An average of 13% of facilities had the tracer items: urine protein dipsticks and haemoglobin test.

Figure 28: ANC service readiness score, by district

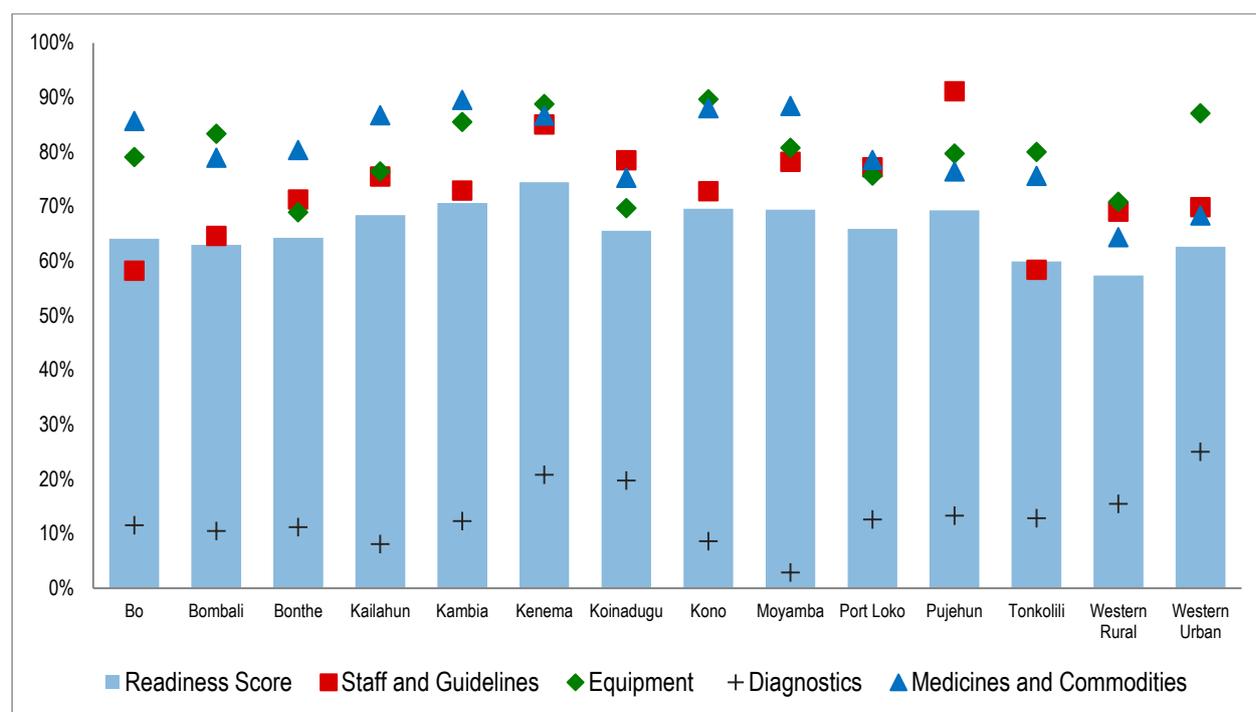


Table 3: Percentage of health facilities with tracer items for providing ANC services

Items	Staff and Guidelines	Equipment	Diagnostics	Medicines and Commodities	Readiness Score
ANC check-lists and/or job-aids	69%				
ANC guidelines available	62%				
At least one trained ANC staff person	87%				
Blood pressure apparatus		80%			
Urine dipstick protein test			22%		
Haemoglobin test			4%		
Folic acid tablets				88%	
Iron tablets				89%	
TT vaccine				82%	
IPT drug				67%	
ITNs				80%	
Percentage of facilities with all items					0%
Mean availability of tracer items					66%

4.2.2 Quality of care of ANC services

Records for ANC and for delivery and newborn care were reviewed for key elements of ANC services, delivery services, and immediate postpartum care. Six hundred fifty-two (652) records at 132 facilities were reviewed for women receiving ANC and delivery/newborn care, with an average of five records per facility reviewed. The SARA 2017 results relevant to these services were available for 131 of these facilities.²

Documentation of ANC services relevant to quality of care:

Generally, few facilities (around 1%) had documented information related to the five components of ANC assessed for QoC (at least 4 ANC visits, anaemia screening, syphilis testing, at least 2 doses of tetanus toxoid, and a written birth plan). ANC record review findings are provided in Table 4, and relevant SARA findings are given in Figure 28.

Antenatal care visits: The average number of ANC visits per woman whose records were reviewed was 3.5 visits (Table 4). The facility average for women who had made four or more ANC visits—an international indicator of QoC for ANC—was 57.8%.

Anaemia screening: Documentation of any type of anaemia screening was allowed, including clinical observation. The facility average for women with anaemia screening documented was 58.9% (Table 4). However, the SARA found that among the facilities assessed for QoC, only 9% (13 facilities) had the capacity to conduct a blood test for haemoglobin or haematocrit (Figure 29), so it is likely that the notes on anaemia described physical findings rather than actual measures.

Table 4: Completeness of ANC records of women who delivered at least 24 hours prior to the survey

Region	Number of records reviewed	Number of facilities	Average percentage of records across facilities where the indicated item was recorded for ANC					Facility average percentage of records with all key items recorded	Average number of items (maximum 5) documented in facilities	Average facility number of	
			At least 4 ANC visits ¹	Anaemia screening	Syphilis screening	At least 2 doses of TT vaccine	Written birth plan			ANC visits per woman ¹ (n=641 cases from 130 facilities)	TT doses received per woman (623 cases from 129 facilities)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Western	86	18	56.7%	70.0%	17.8	72.2%	7.8%	4.4%	2.2	3.6	1.7
Eastern	135	26	49.6%	40.0%	3.7%	47.4%	8.2%	1.5%	1.5	2.9	1.2
Southern	215	42	60.0%	75.4%	6.5%	72.6%	2.3%	0%	2.2	3.5	1.9
Northern	216	43	62.7%	50.0%	0.5%	72.3%	2.3%	0%	1.9	3.7	1.8
Total	652	129	57.8%	58.9%	5.1%	67.3%	4.2%	0.9%	1.9	3.5	1.7

¹ 11 records had a “don’t know” response so were classified as missing information.
² 29 records had missing information.

² One record review facility was not linked with the SARA database. This may be an issue of using different facility names or incorrect entering of the facility code.

Syphilis screening: The facility average for recording that they had screened for syphilis was 5.1% (Table 4). The rapid test for syphilis was not widely available, found in only 11% of facilities where QOC was assessed. Among these facilities, Northern region had the most facilities with syphilis rapid test capacity (16% of facilities) (Figure 29).

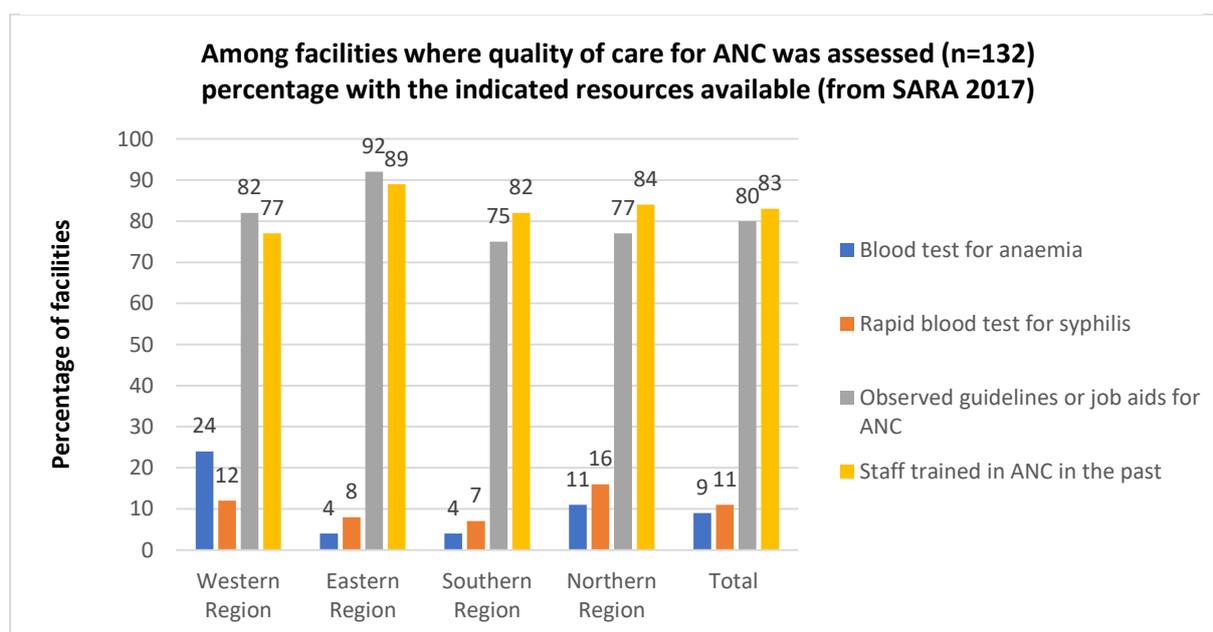
Tetanus toxoid: The facility average for two TT injections was 67.3%, with the Eastern region having the lowest average (47.4%). The SARA findings were that over 90% of facilities reported that TT was a routine component of ANC, with the Eastern region having the lowest percentage (77%) of facilities reporting that TT was a routine component of ANC. Eight-four percent (84%) of the facilities had TT vaccine available at the time of the SARA visit, with the Eastern region having the lowest percentage (69% of facilities).

Written birth plan: The facility average for records of birth plans was only 4.2%. The Western and Eastern regions had slightly higher facility percentages of records with birth plans (around 8%).

Support for quality services:

Guidelines and job aids provide guidance and reinforcement on the services that are to be provided, and how to provide the services. On average, 80% of facilities had guidelines or job aids for ANC services. The Eastern region had the highest percentage of facilities with guidelines (92%). The other regions were similar, ranging from 75% to 82% (Fig. 29).

Figure 29: Availability of equipment, work aides, and trained staff for ANC services

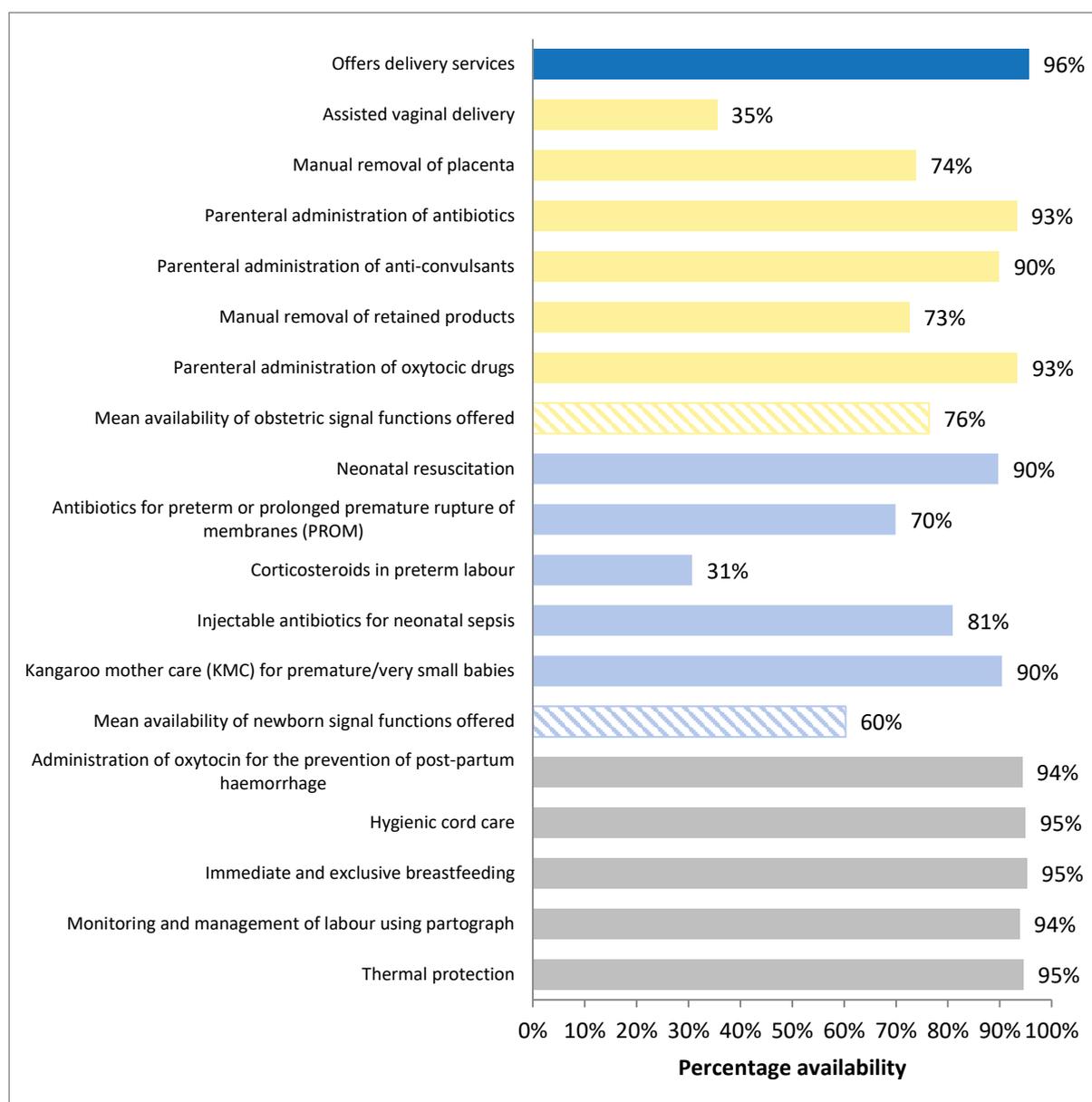


Trained staff: The SARA assesses whether any service providers received training in ANC in the prior two years (Fig. 29). On average, 83% of the facilities reported that an ANC service provider had received training in this period. Findings were similar across regions, with the Eastern having the highest percentage (89%) and the Western region the lowest (77%). Generally, few facilities (around 1%) had documented information related to the five components of ANC for which this information was sought.

4.2.3 Obstetric and newborn care

Improving maternal, neonatal and infant outcomes is a high priority in Sierra Leone's RMNCAH strategy and health sector strategic plan. The Emergency Obstetric and Neonatal Care (EmONC) strategy has been adopted as part of a plan to reduce mortality rates. Sixty-four (64) health facilities, predominantly hospitals, have been designated as basic EmONC (BEmONC) sites. SARA+ assessed the availability of BEmONC signal functions at these sites.

Figure 30: Percentage of designated health facilities providing the BEmONC signal functions (N=64)

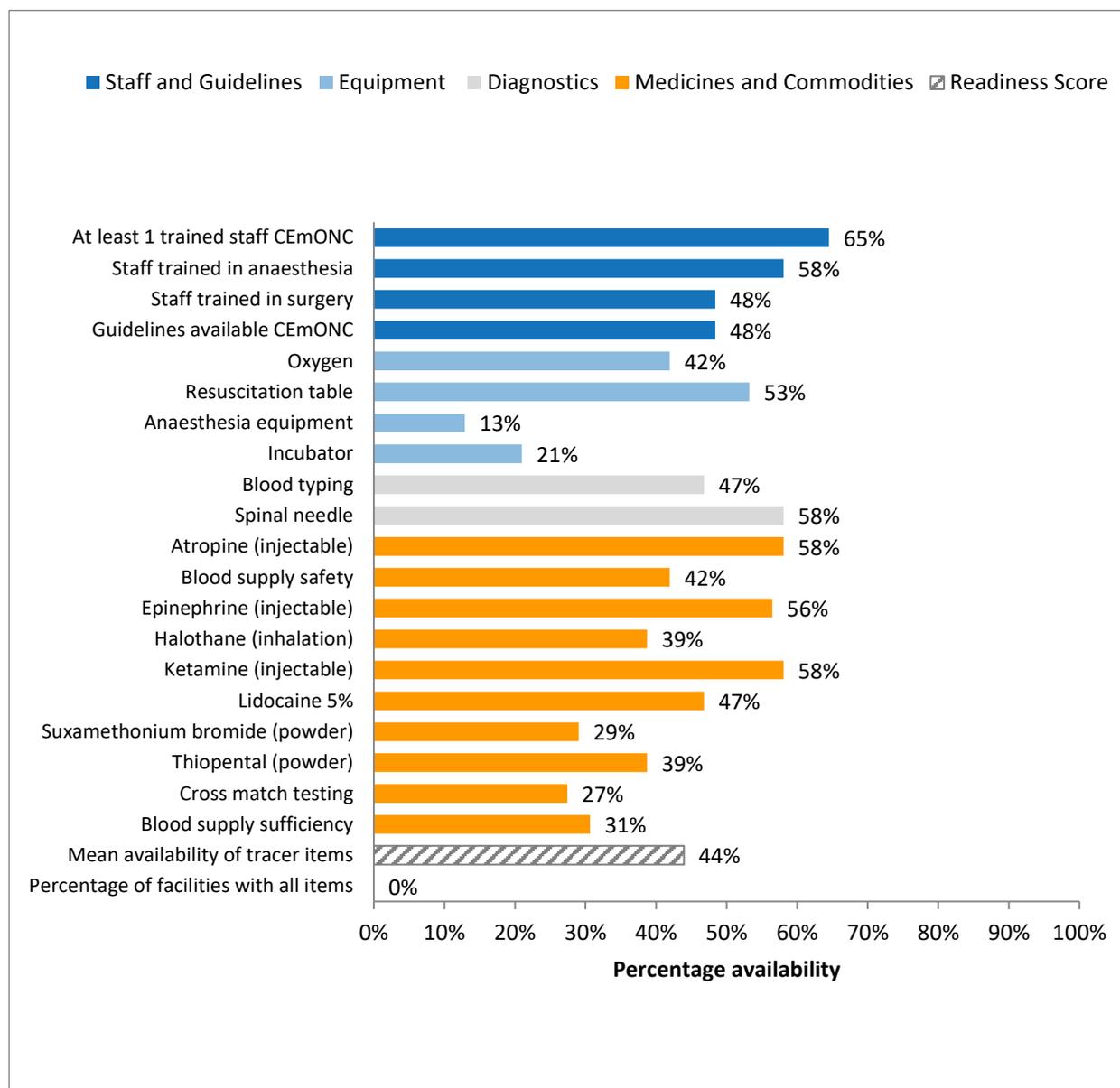


The mean availability of obstetric signal functions offered was 96%. The mean availability of newborn signal functions offered was 73%. There was mixed understanding about the use of corticosteroids in preterm labour; 59% of the BEmONC sites offered the service (Fig. 30).

Seventeen (17) hospitals are designated as comprehensive EmONC (CEmONC) sites. Spread across the 14 districts, these hospitals provide advanced obstetric care services. Assessed for the

additional CEmONC signal functions, all 17 hospitals provided caesarean section and blood transfusion services. Figure 31 shows the distribution of CEmONC tracer items as markers for readiness to offer the service.

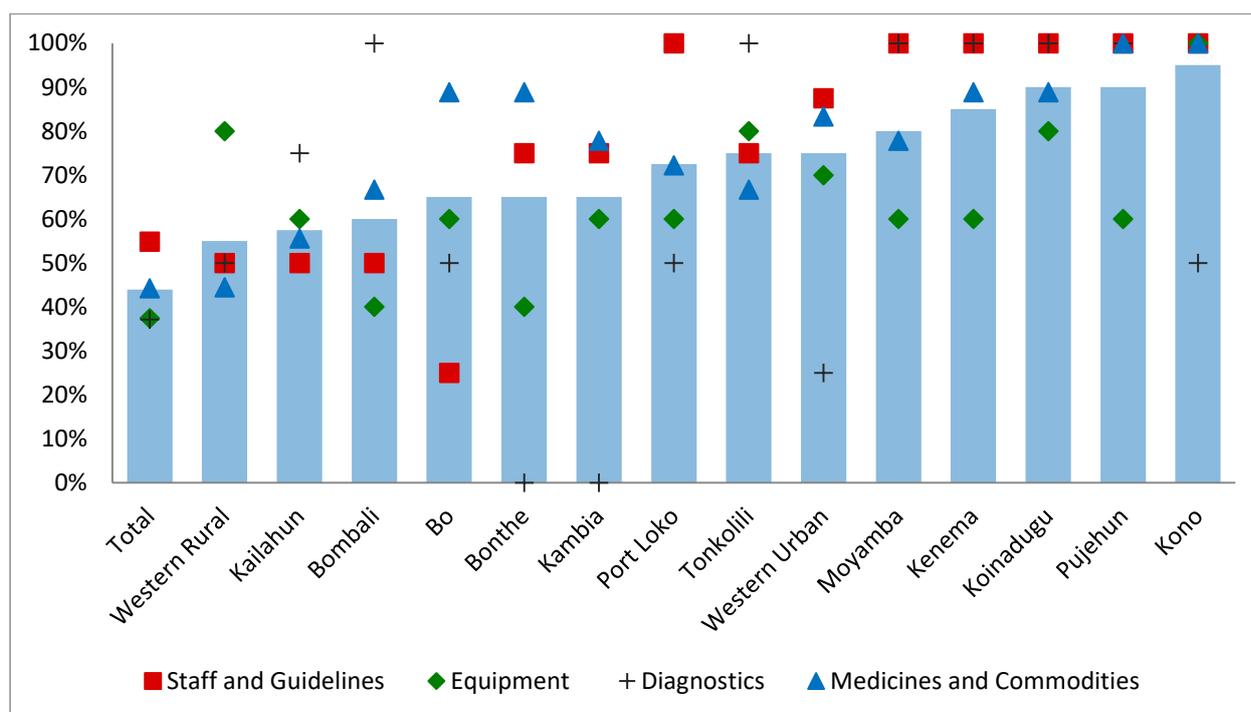
Figure 31: Percentage of designated facilities with tracer items for CEmONC services



None of the CEmONC sites had all the tracer items required. The mean availability of tracer items was 73%. Anaesthesia equipment, neonatal incubators, capacity to cross match blood and sufficiency of blood supply were the greatest drawbacks to service readiness. These were available at only five to seven of the 17 CEmONC facilities.

There were great variations in service readiness across the districts, ranging from 55% in Western rural to 95% in Kono (Fig. 32). The availability of trained staff and guidelines and equipment were the greatest challenges to CEmONC service readiness. Associated diagnostic services were a challenge in Bonthe, Kambia and Western urban districts, where the CEmONC sites did not have capacity for blood typing and cross-matching.

Figure 32: Percentage of designated facilities with CEmONC tracer items, by district (N=17)



4.2.4 Quality of care – Delivery and newborn care services

QoC for delivery and newborn care services

Items assessed for delivery and newborn care are those recommended by international experts as indicators for QoC.

Partograph: The facility average for the use of the partograph was 69.7%, with the Western region having the lowest average (62.2%) and the Eastern region the highest (82.2%) (Table 5). Essentially, all facilities (98%) reported that they used partographs; however, 11% did not have partographs available at the time of the SARA survey. There was no association between the finding of completed partographs and the availability of blank partographs at the time of the SARA survey.

Oxytocin: The facility average for documenting provision of oxytocin was 73.2%, with the Eastern region having the highest rate (85.2%) and the Northern region the lowest (63.2%). There was no association between these findings and the 2017 SARA findings on the availability of oxytocin. All but one facility reported that they offered oxytocin injection as a routine delivery service, but 20% of the facilities had no oxytocin in the delivery service area (where it is an essential drug) and 10% had no oxytocin at the facility. The Western region had the lowest availability of oxytocin in the delivery service area (59%) and at the facility (71%).

The **maternal outcome** (live, death, complications) was recorded at an average of 85.8% of the facilities, with this most commonly done in the Southern region (97.7%) and least frequent in the Northern region (77.7%).

In Sierra Leone, it is recommended that a woman stay at the facility for at least 24 hours after the birth. On average, 89% of the records across facilities documented that the woman stayed for 24 hours after birth. The Southern and Eastern regions had the highest averages (93%) and the Northern region had the lowest (78.6%).

Support for quality services

Guidelines and job aids: Seventy-three percent (73%) of facilities had guidelines for essential childbirth and delivery care available (data not shown).

Trained staff: Seventy-nine percent (79%) of the facilities had staff who had been trained in delivery or newborn care in the prior two years (data not shown).

In general, the Eastern region was consistently stronger for all indicators, closely followed by the Southern region. The Northern region had the weakest documentation of delivery service indicators (Table 5). This was also the finding for the service readiness items that were assessed, including for availability of guidelines and recent staff training.

Table 5: Record review for delivery and newborn care services

Among women who delivered at least 24 hours prior, recorded delivery information for mother and infant											
Region	Average of the percentage of records reviewed in each facility where the indicated item was recorded (n=132)								Facility average percentage of records with all key items recorded	Average number of items (max 8) documented in facilities	Avg. % of low birthweight (<2500 gm) (539 cases from 110 facilities ¹)
	Maternal care				Infant care						
	Partograph used	Oxytocin given	Maternal outcome recorded	Woman stayed 24 hours postpartum	Infant outcome recorded	Apgar score recorded at 1 and 5 minutes	Birth weight recorded	BCG provided			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Western	62.2%	78.9%	80.0%	84.4%	90.0%	64.4%	86.7%	42.2%	28.9%	5.9	1.3%
Eastern	82.2%	85.2%	83.7%	92.6%	92.6%	92.6%	65.2%	63.7%	23.7%	6.6	1.1%
Southern	68.8%	73.5%	97.7%	93.0%	97.2%	75.8%	96.3%	33.5%	25.6%	6.4	3.3%
Northern	65.8%	63.2%	77.7%	78.6%	94.6%	59.1%	75.1%	12.7%	4.1%	5.3	1.2%
Total	69.7%	73.2%	85.8%	89.0%	94.4%	72.1%	81.7%	33.9%	18.5%	5.9	2.0%

¹ 22 facilities had missing data or data that were out of any reasonable range (less than 1000 grams).

QoC for the newborn care services:

Infant outcome recorded: An average of 94.4% of the records in all facilities had the infant outcome (stillbirth, livebirth, complications) recorded, with the Southern region having the highest level (97.2%) and the Western region having the lowest (90%) (Table 5).

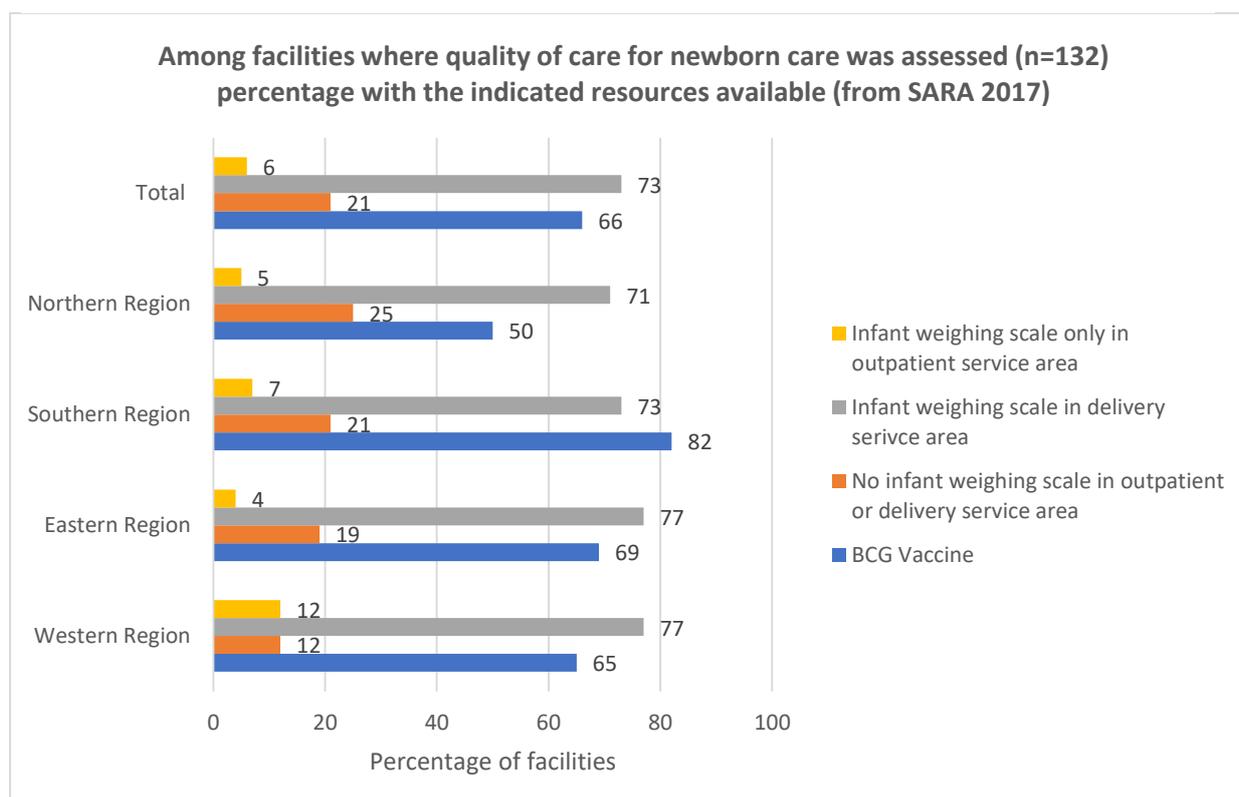
Apgar score: Across the facilities, an average of 72.1% had the Apgar score recorded, at both 1 and 5 minutes postpartum. There were large differences in practices among the regions, with the Eastern region having the highest average (92.6%) and the Northern region having the lowest (59.1%).

Birthweight: The birthweight was recorded, on average, at 81.7% of facilities, from a high of 96.3% (Southern region) to a low of 65.2% (Eastern region). Functional infant scales were found in the delivery service area at 73% of the facilities (Fig. 33). There was no association between the availability of functional scales in the service area and the recording of birth weights. An additional 6% of facilities had infant scales in the outpatient service area, but this location would likely not be sufficiently close for them to be used for taking birthweights, except in small clinics.

BCG vaccine: An average of 33.9% of the records across facilities had a birth-dose BCG recorded, with the range from 63.7% (Eastern region) to 12.7% (Northern region). BCG vaccine availability was highest in the Southern region (82%) and lowest in Northern region (50%) (Fig. 33).

In general, there was no consistency among the regions as to which ones were highest or lowest across the indicators in the record review. The Northern region had the lowest percentages for newborn care items assessed in the SARA.

Figure 33: Availability of items for newborn care services



4.3 Child and Adolescent Health

4.3.1 Immunization services

Scaling up immunization services is critical to the reduction of child mortality. Ninety-five percent (95%) of facilities reported the provision of child immunization services (Fig. 34). Eighty-nine percent (89%) of facilities had infant vaccines; 87% had adolescent and adult vaccines; and only 53% had birth doses at the time of the assessment. The frequency of offering these services was mainly weekly immunization days, either at the facility or as an outreach service. Sixteen percent (16%) of facilities provided the service monthly, and only 12% had the service available daily at the facility. Outreach immunization services were commonly available; about two of every three facilities visited offered the service weekly.

Figure 33: Percentage of health facilities offering immunization services (N=1284)

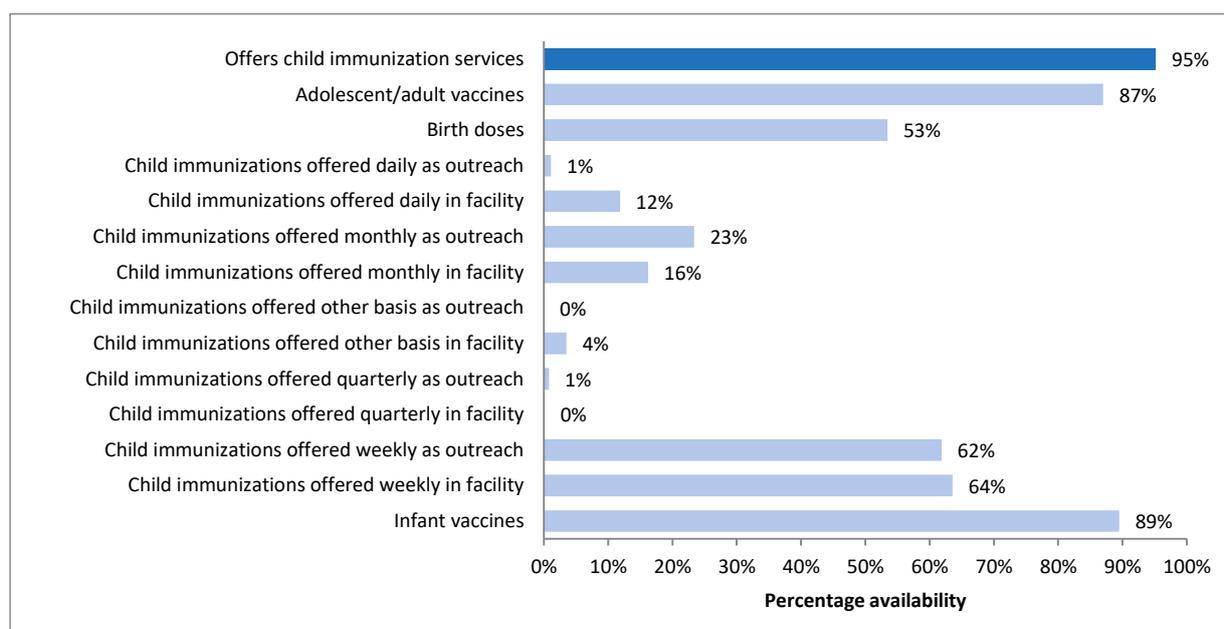
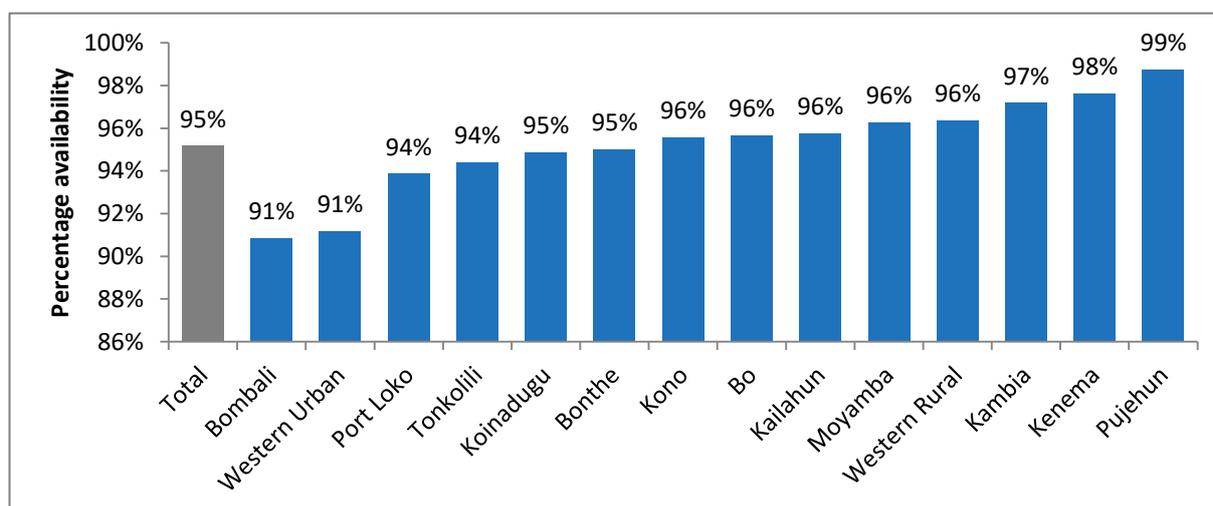


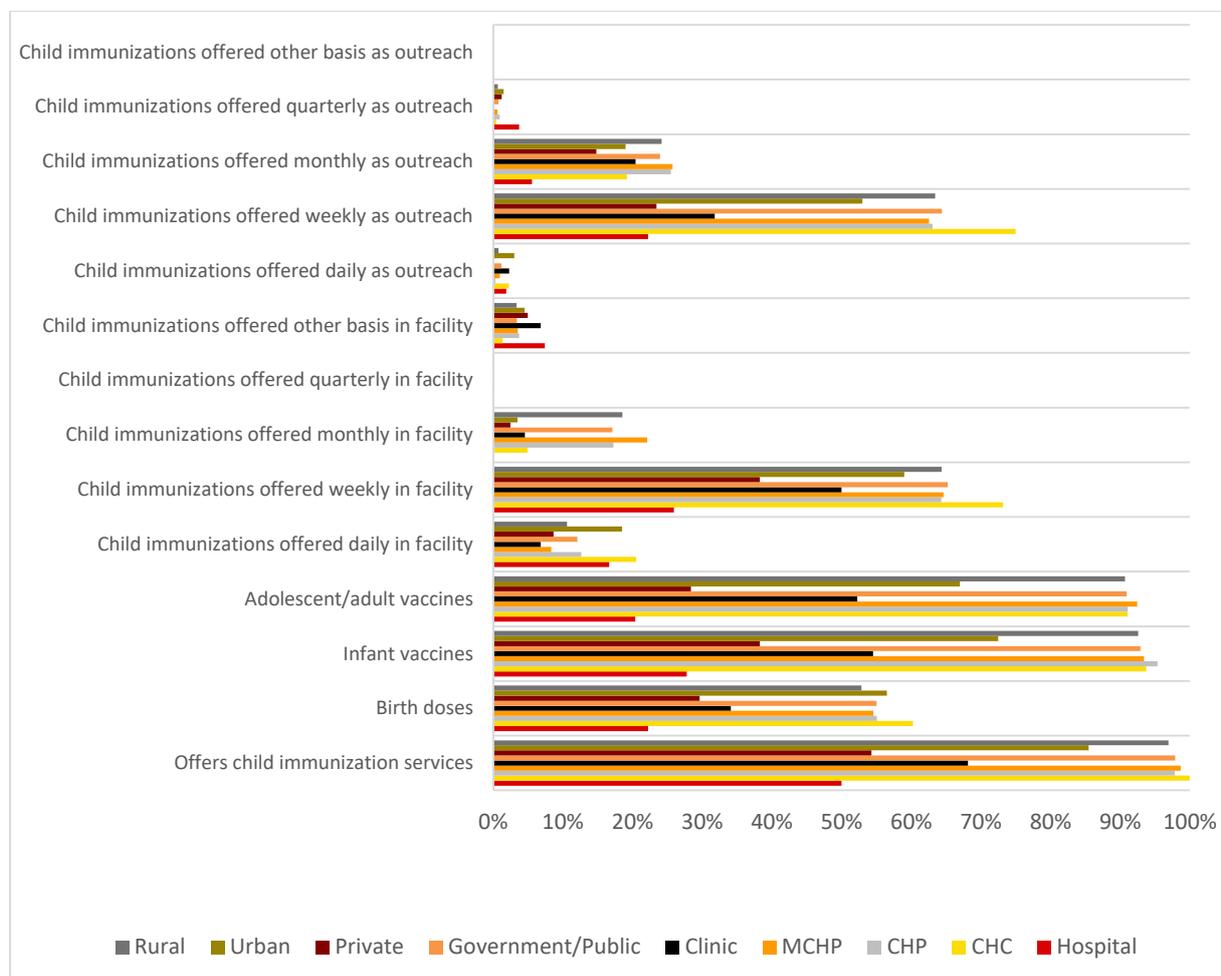
Figure 34: Percentage of health facilities offering immunization services, by district.



Child immunization services were available across all districts. Over 90% of facilities reported offering the service. However, about 10% of facilities in Bombali and Western urban districts did not offer immunization services (Fig. 35).

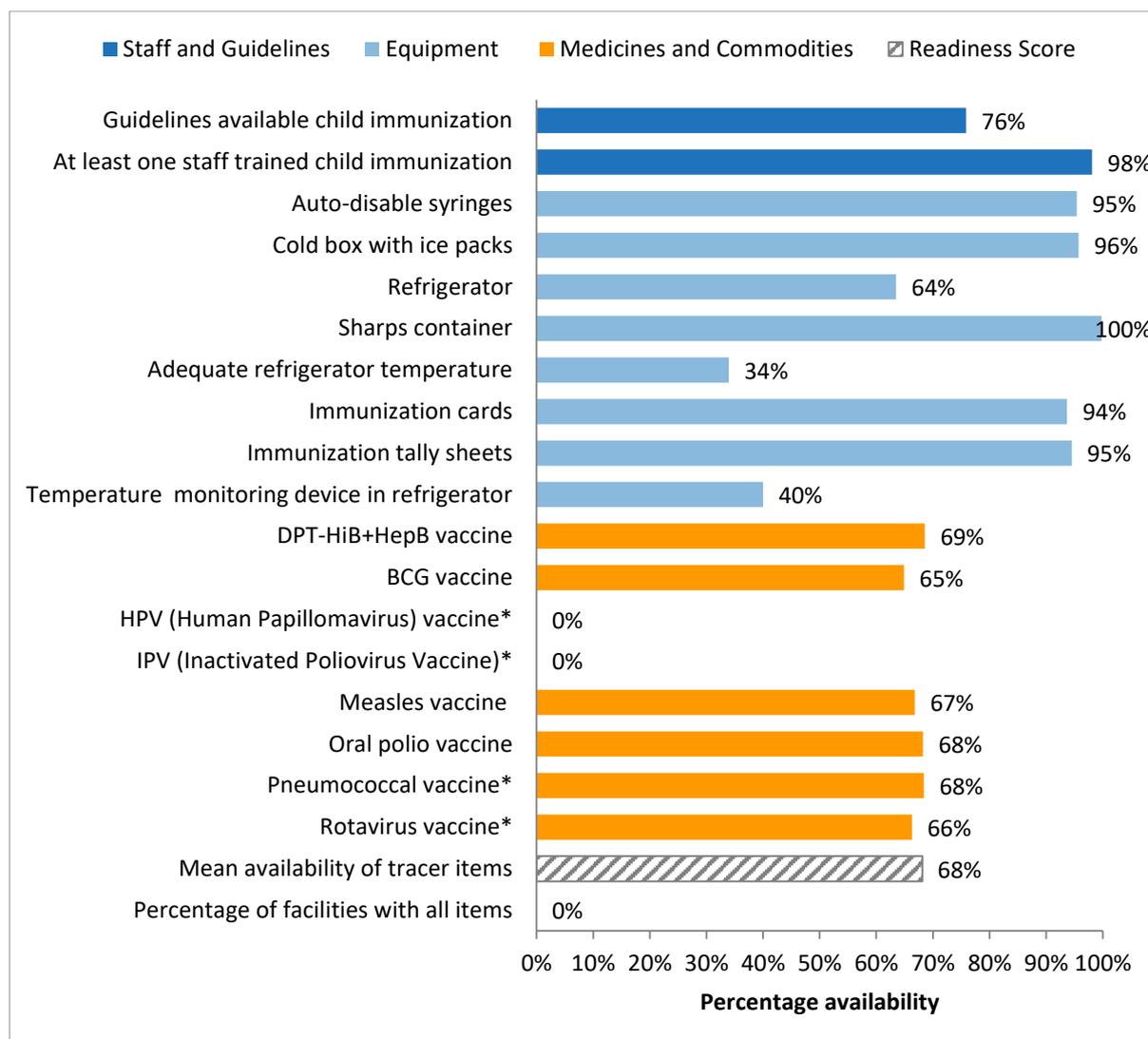
Child immunization services were highly available across most health facilities. Fifty-five percent (55%) of privately owned facilities offered the services (Fig. 36). Fifty percent (50%) of hospitals did not offer the services at the time of assessment. The services were predominantly available in government primary health care facilities.

Figure 35: Percentage of facilities offering immunization services, by type and location



Readiness for provision of immunization services: The mean readiness score for immunization services was 68% (Fig. 37). On average, two of every three facilities assessed had varied combinations of the tracer items required to effectively provide immunization services. None of the facilities had all the tracer items required. Equipment for maintaining the cold chain for immunization commodities was predominantly cold boxes; they were available at 96% of facilities. However, only two of every three immunization health facilities had a refrigerator. Forty percent (40%) of facilities had refrigerator temperature monitoring devices, and adequate temperature readings were observed at 34% of the health facilities. Two of every three health facilities offering immunization services had all the immunization vaccines, except human papillomavirus (HPV) and inactivated polio vaccine (IPV), which were not available at any facility visited.

Figure 36: Percentage of health facilities that have tracer items for child immunization services (N=1222)



Commodity security of immunization vaccines was high. Eight percent (8%) of health facilities reported stockouts of measles and BCG vaccines in the three months prior to the assessment (Fig. 38). Four percent (4%) of facilities reported stockouts of other vaccines (DPT, oral polio vaccine [OPV], and pneumococcal vaccines). IPV and HPV vaccines have never been stocked in any of the facilities.

Figure 37: Percentage of health facilities offering immunization services that reported stockouts of vaccines in the last three months (N=1222)

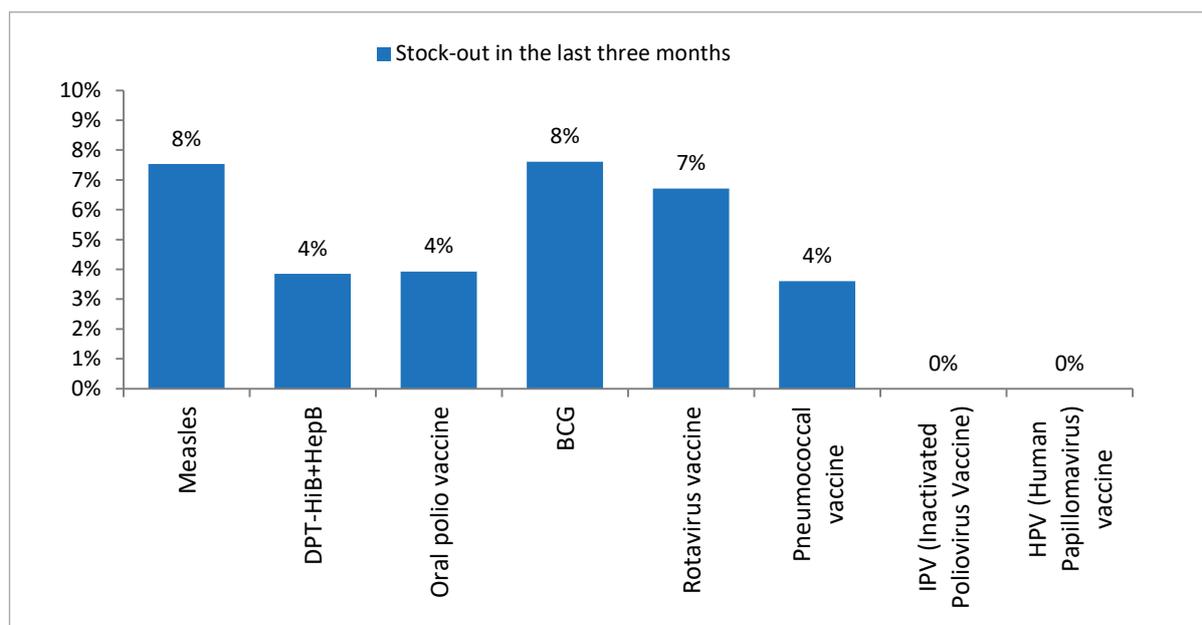
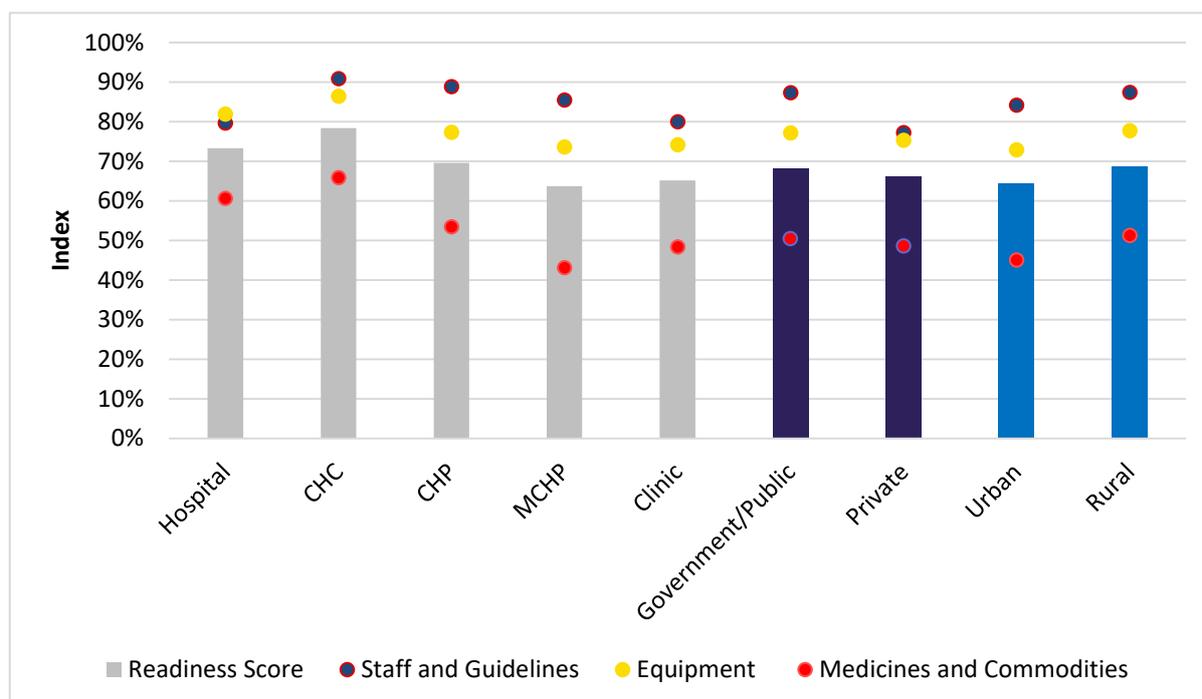
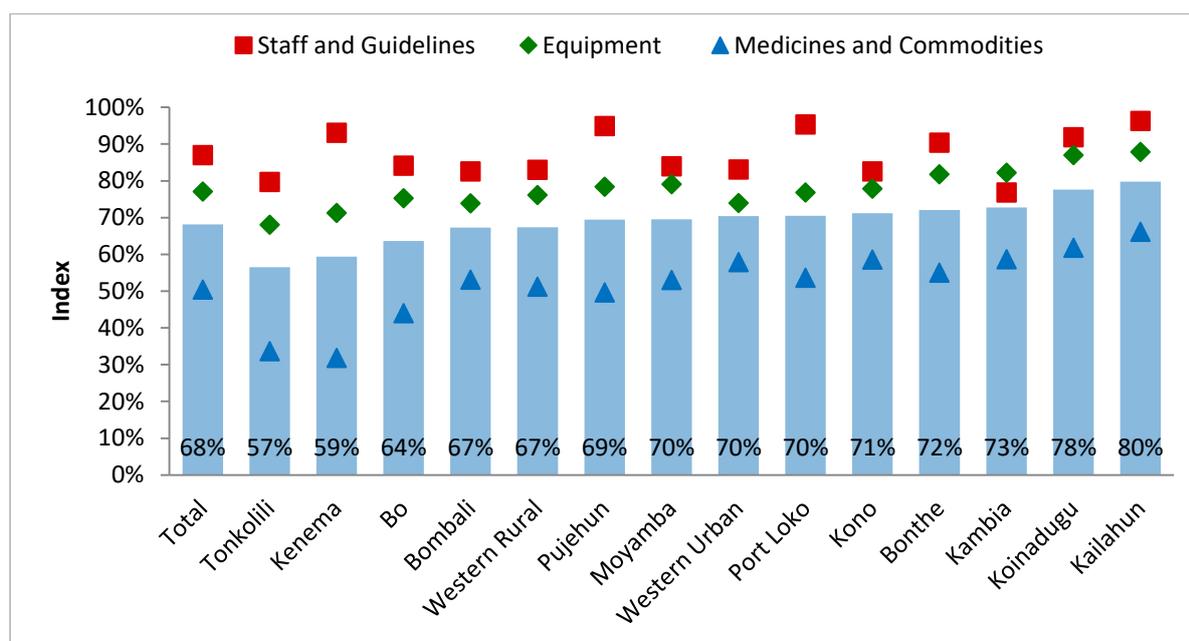


Figure 38: Percentage of health facilities with tracer items for offering child immunization services (N=1222)



The immunization service readiness was highest at CHCs and lowest at MCHPs (Fig. 39). Irrespective of facility type, the greatest challenge to service readiness was the availability of immunization medicines and commodities. The availability ranged from 43% at MCHPs to 66% at CHCs. There were no major differences in service readiness between public and private facilities or urban and rural facilities.

Figure 40: Percentage of health facilities with tracer items for immunization services, by district

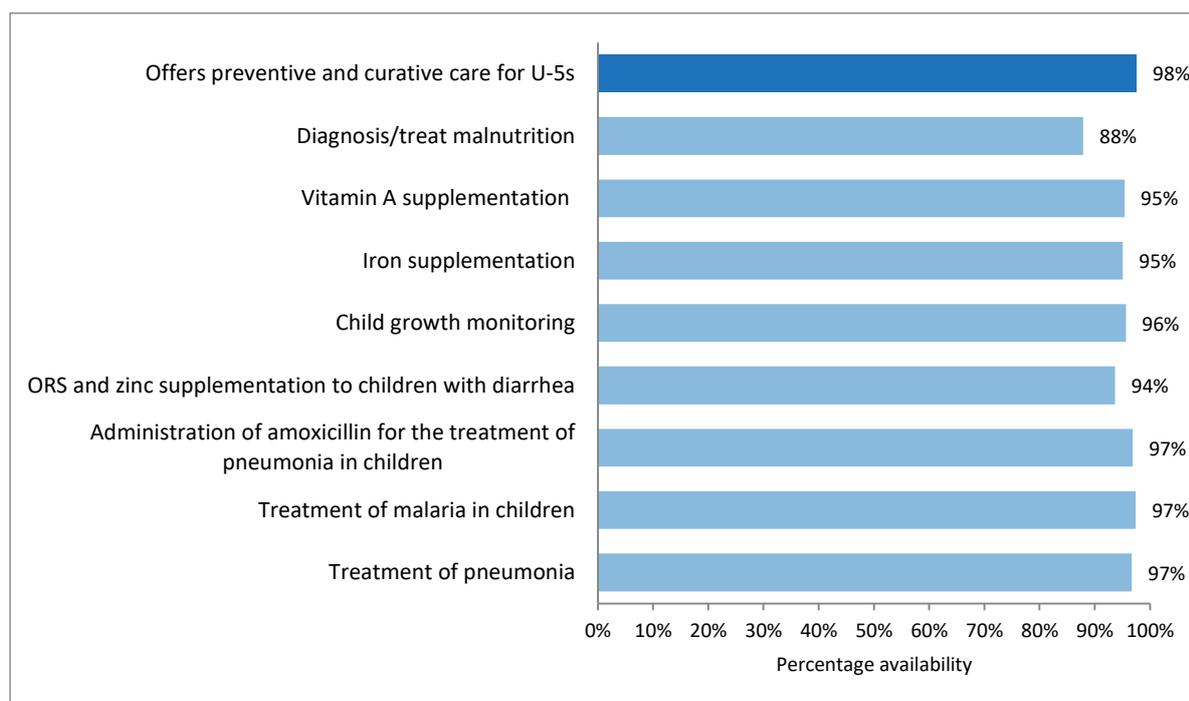


There was great district variation in the service readiness for immunization services, ranging from 57% in Tonkolili to 80% in Kailahun (Fig. 40). The availability of medicines and commodities remains the greatest challenge to service readiness for all districts.

4.3.2 Child preventive and curative services

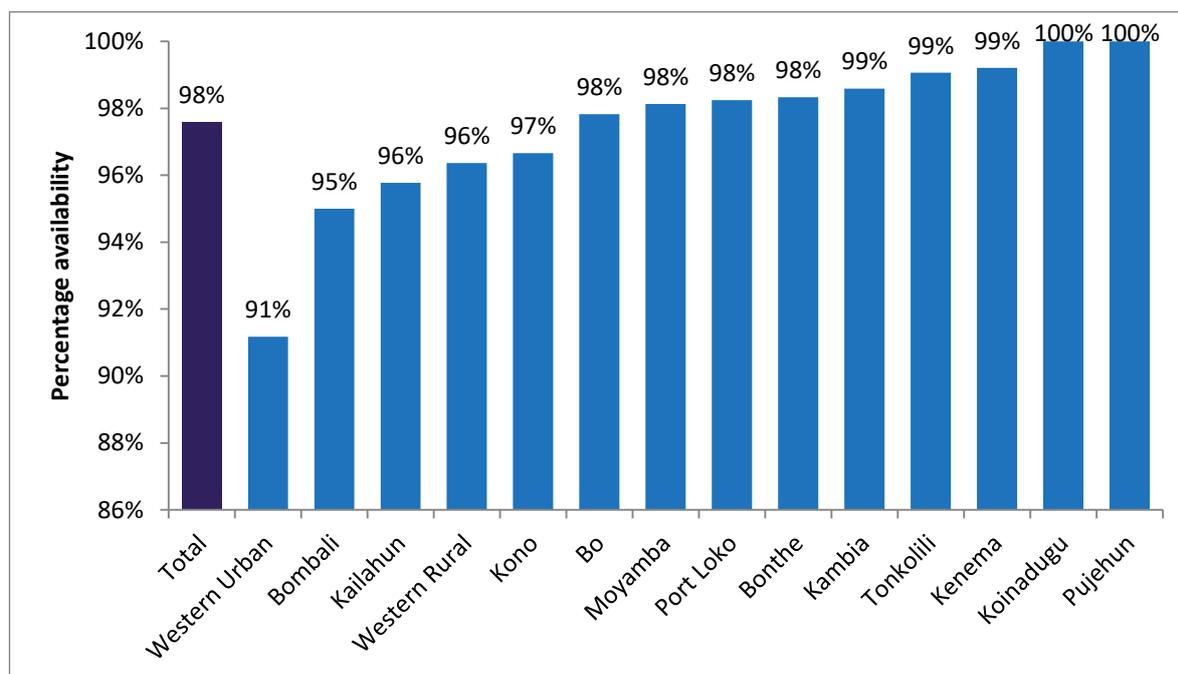
The SARA 2017 assessed the following child preventive and curative care services: preventive and curative care for children under 5 years; malnutrition diagnosis and treatment; vitamin A supplementation; iron supplementation, oral rehydration salt (ORS) and zinc supplementation; growth monitoring; treatment of pneumonia; administration of amoxicillin for the treatment of pneumonia in children; and treatment of malaria in children. Over 94% of health facilities were found to have all child health services available, except for the diagnosis and treatment of malnutrition, which was available in 88% of the facilities (Fig. 41).

Figure 39: Percentage of health facilities offering child health preventative and curative services (N=1284)



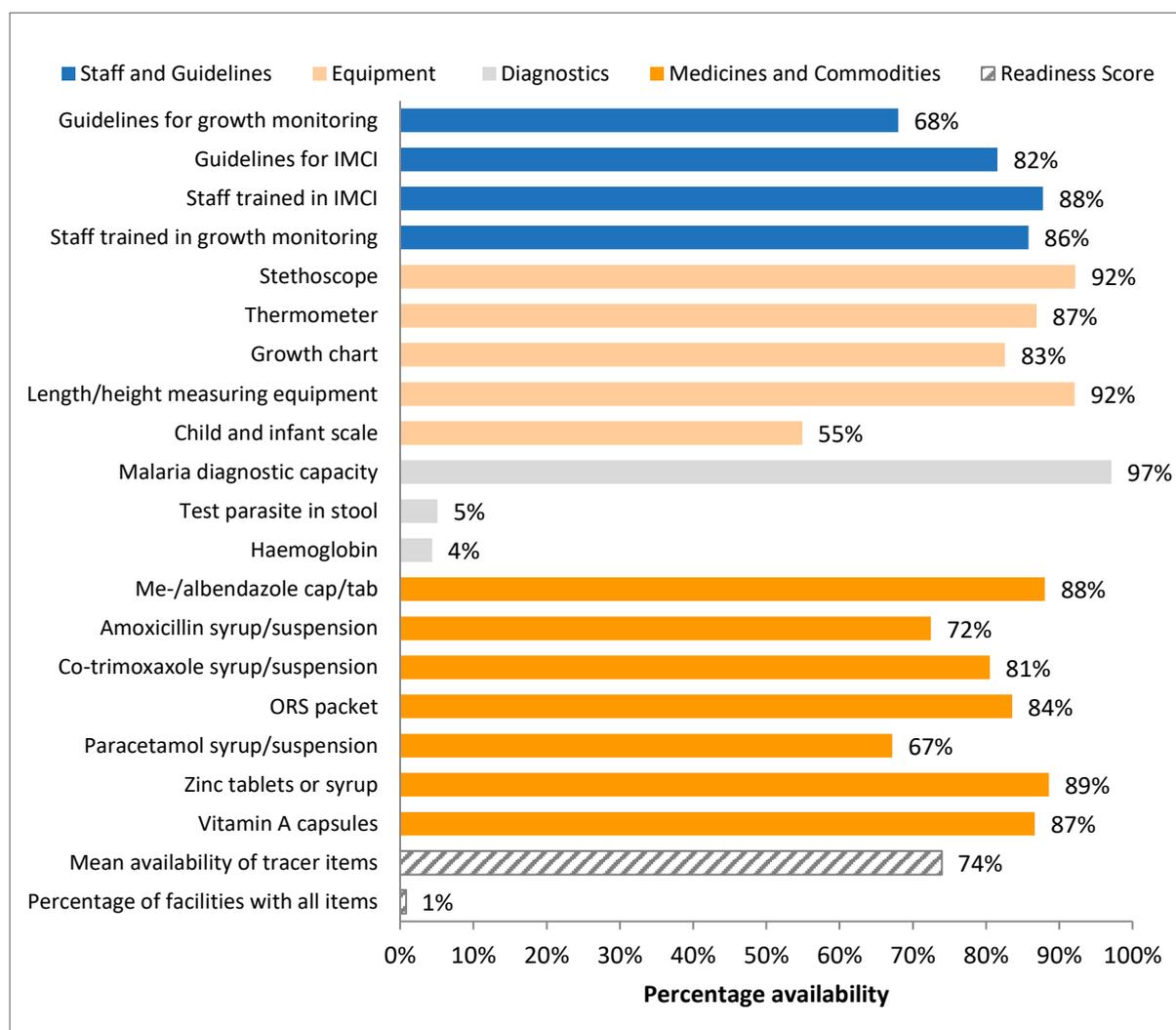
The availability of child health services was essentially the same across all 14 districts (Fig. 42). All facilities in Pujehun and Koinadugu offered child health services. A small proportion of facilities did not offer these services: 1% of facilities in Kambia, Tonkolili and Kenema; 2% in Bo, Moyamba, Port Loko and Bonthe; and 9% in Western urban district.

Figure 40: Percentage of health facilities offering child health services, by district



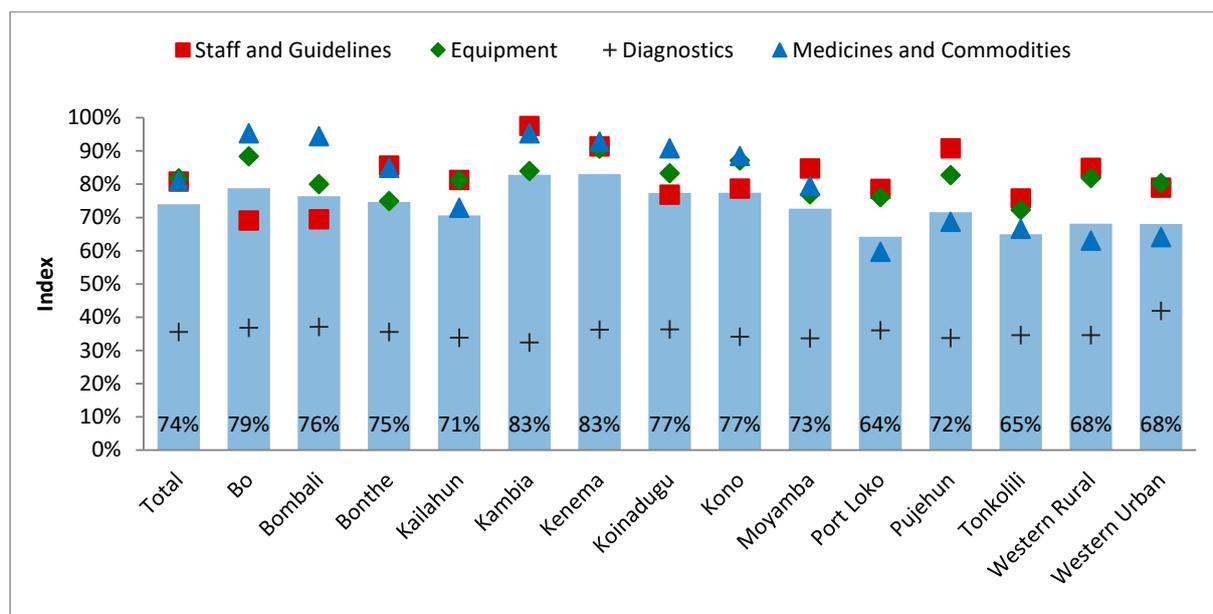
Readiness for provision of child health services: Health facilities were generally ready to provide child health services. Over 80% of facilities had staff trained on Integrated Management of Childhood Illnesses (IMCI) and the IMCI guidelines were available in the facilities at the time of the assessment (Fig. 43). Over 83% of facilities had the basic equipment for examining children, except for child and infant weighing scales, which were available at 55% of facilities. Ninety-seven percent (97%) of facilities had the capacity to diagnose malaria. However, stool microscopy and haemoglobin testing were limited to 5% and 4% of facilities, respectively, to hospitals and a few CHCs.

Figure 41: Percentage of facilities with tracer items for offering child health services (N=1253)



There were no major differences across the districts in their readiness to offer child health services. All districts, except Port Loko, had a service readiness index of over 64%. Meaning that over 64% of facilities in all districts had the tracer items required to provide child health services (Fig. 44). SARA used the haemoglobin test, stool parasite test and malaria test as the tracer items for diagnostic capacity for child health services. Notably, an average of 36% of facilities had the diagnostic capacity necessary to offer child health services.

Figure 42: Percentage of health facilities with tracer items to offer child health services, by district



4.3.3 Adolescent health

Overall, 89% of facilities reported offering adolescent health services (Fig. 45). The services that were highly available included male condoms, oral contraceptives and emergency contraceptive pills. However, HCT, ART and intrauterine contraceptive device (IUCD) insertion services were not commonly available for adolescents. Fifteen percent (15%) of facilities offered IUCD insertion and 34% provided ART to adolescents. One of every three facilities did not offer HCT services for adolescents. Adolescent services were predominantly available in government (91%) and rural health facilities (90%) (Table 6).

Figure 43: Percentage of health facilities offering adolescent health services (N=1284)

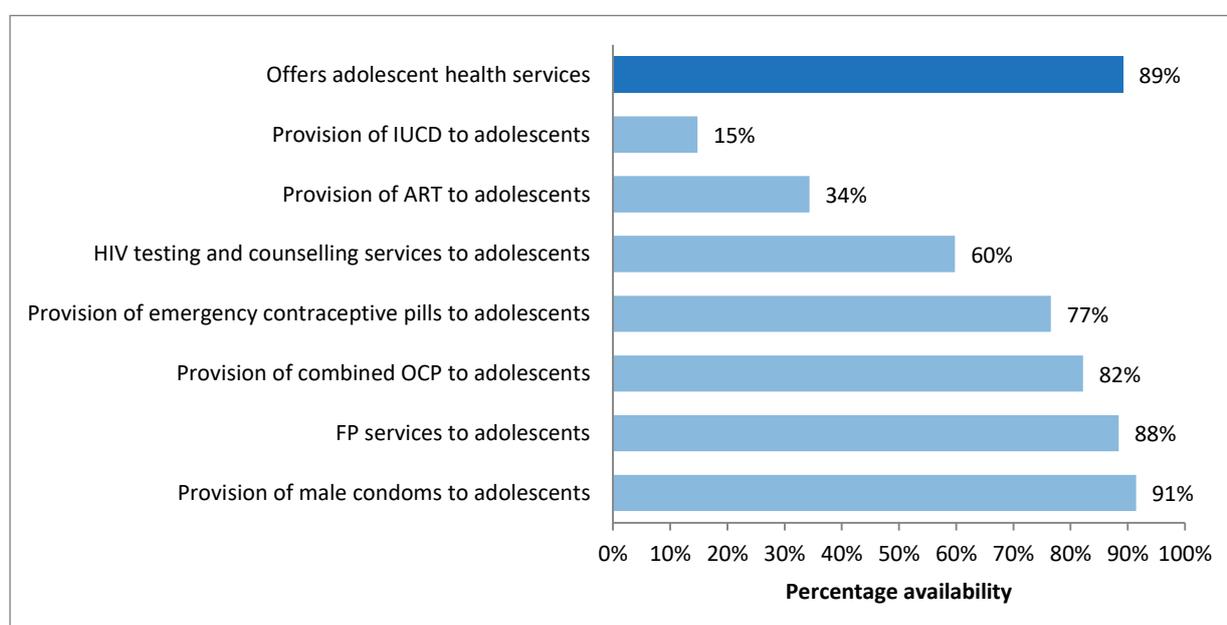
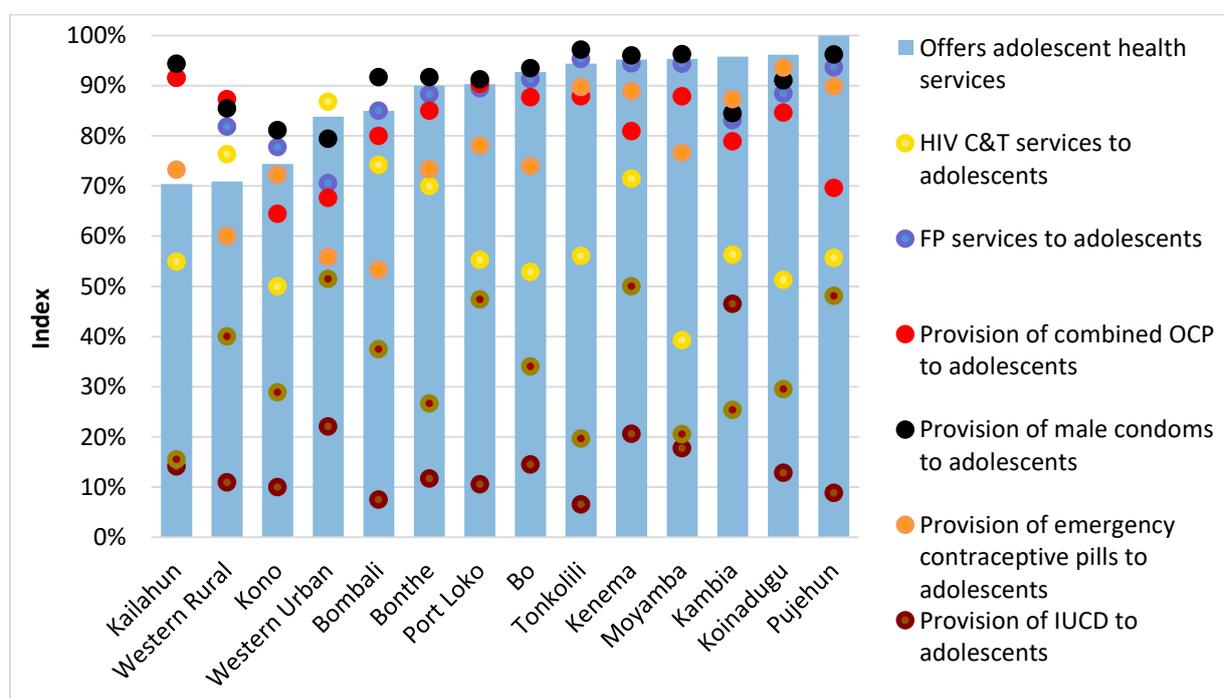


Table 6: Availability of adolescent services, by facility type, ownership and location

	Offers adolescent health services	HCT services to adolescents	FP services to adolescents	Provision of combined OCP to adolescents	Provision of male condoms to adolescents	Provision of emergency contraceptive pills to adolescents	Provision of IUCD to adolescents	Provision of ART to adolescents	Total number of facilities
Facility type									
Hospital	70%	83%	48%	52%	52%	46%	43%	70%	56
CHC	94%	94%	96%	86%	98%	83%	40%	74%	224
CHP	87%	62%	91%	83%	95%	75%	10%	29%	328
MCHP	91%	44%	91%	85%	94%	82%	6%	21%	629
Clinic	75%	61%	55%	55%	57%	41%	16%	16%	47
Managing authority									
Government/ Public	91%	59%	92%	85%	95%	80%	14%	34%	1203
Private	68%	65%	38%	43%	42%	28%	20%	36%	81
Urban/Rural									
Urban	84%	83%	76%	73%	80%	69%	21%	53%	200
Rural	90%	56%	91%	84%	94%	78%	14%	31%	1084
Total	89%	60%	88%	82%	91%	77%	15%	34%	1284

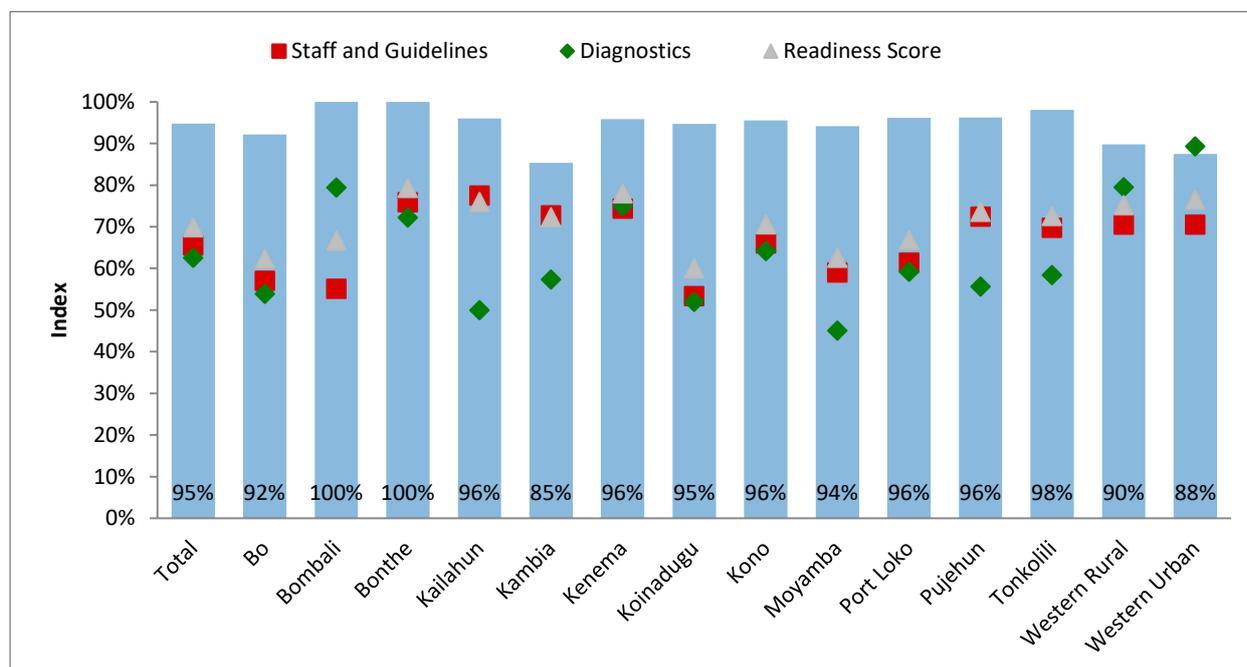
Figure 44: Percentage of health facilities offering adolescent health services, by district



Across all districts, the availability of IUCD insertion services for adolescents and ART was low (Fig. 46). Less than 50% of facilities offered these services. The availability of HCT services was also not optimal across the districts. On average, 55% of facilities offered the service to adolescents. The range across districts was 50% to 70% of facilities offering HCT services to adolescents. Western urban district had the highest availability, at 89%, and Moyamba district had only 40% of facilities offering HCT services to adolescents.

Readiness for provision of adolescent services: Adolescent integrated services are an essential part of a responsive health service. SARA+ used adolescent FP and HIV services to assess the health facility readiness to provide adolescent services. On average, 70% of facilities had varied combinations of tracer items necessary to offer adolescent services (Fig. 47). Twenty-five percent (25%) of facilities had all the tracer items necessary. Human resource capacity remained a challenge; just 50% of facilities had trained staff and relevant guidelines and aids available. Five districts (Koinadugu, Bo, Moyamba, Bombali and Port Loko) had service readiness scores below the national average.

Figure 45: Percentage of health facilities with tracer items required to provide adolescent health services, by district (N=1145)



4.4 Nutrition services

Nutrition services were not assessed as a standalone service in this SARA. However, various aspects of nutrition services were assessed under maternal and child health, malaria management, HIV care and TB care. Strong opinions were expressed during the data validation workshop by nutrition programme staff to have nutrition included in the next SARA.

4.5 Communicable Diseases

4.5.1 HIV services

HCT services were available at 62% of all facilities (Table 7). The greatest availability was in the Western urban district, at 88%, and the least in Moyamba district, at 41% (data not shown). CHCs had the highest availability of HCT services (96%). Urban health facilities were more likely to offer the service (86%) compared with rural facilities (58%).

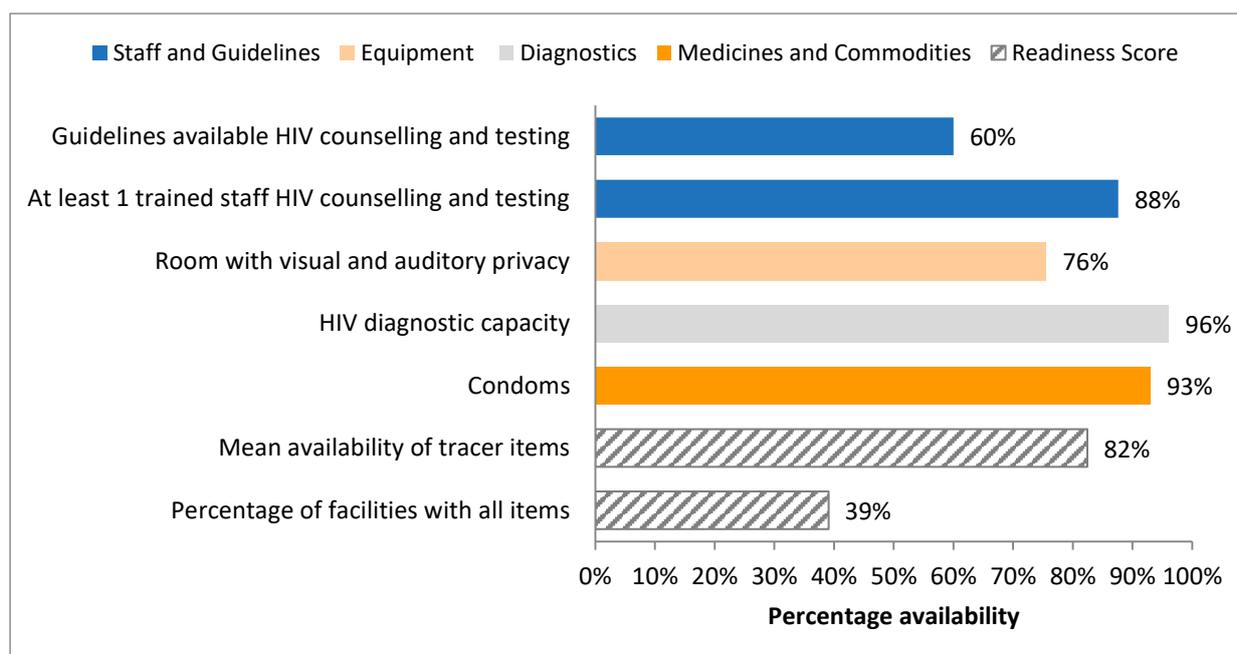
Readiness for provision of HCT services:

Two of every five of the 798 facilities assessed for HIV services had all the resources, personnel, equipment, medicines and supplies necessary for the provision of HIV services (Fig. 48). Eighty-two percent (82%) of facilities had the tracer items for readiness. The greatest limitations to readiness were the availability of guideline documents and appropriate private counselling rooms.

Table 7: Proportion of health facilities providing HCT services

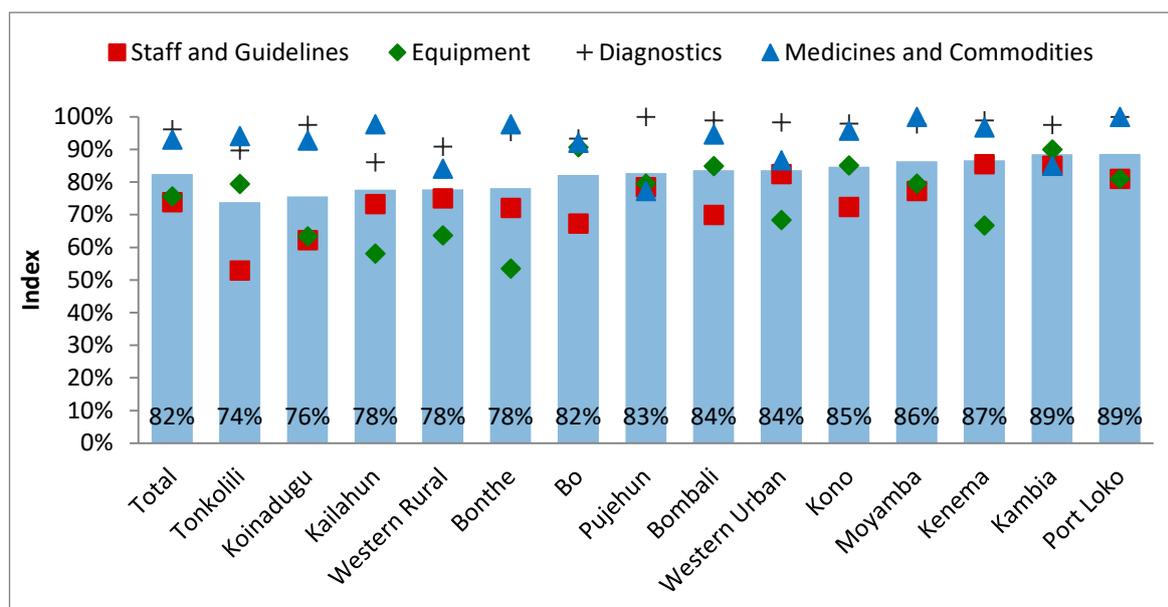
	Offers HCT services	Total number of facilities
Facility type		
Hospital	91%	56
CHC	96%	224
CHP	64%	328
MCHP	46%	629
Clinic	66%	47
Managing authority		
Government/Public	62%	1203
Private	72%	81
Urban/Rural		
Urban	86%	200
Rural	58%	1084
Total	62%	1284

Figure 46: Percentage of health facilities with tracer items for offering HCT services (N=798)



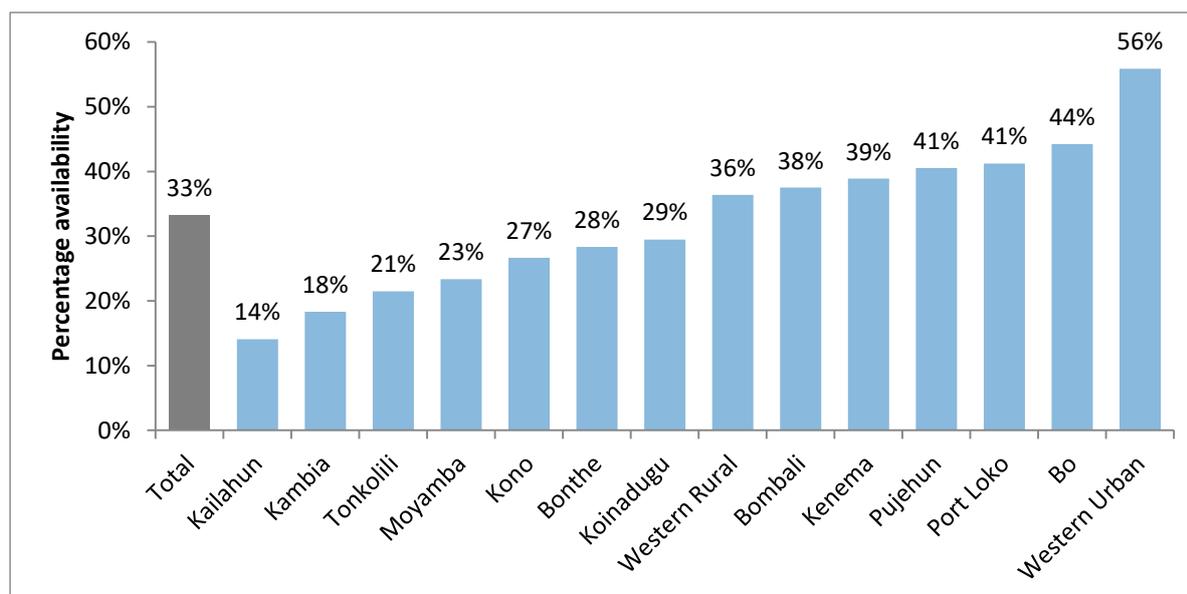
Service readiness for HCT was at 82% (Fig. 49). The greatest limitations to readiness were the availability of appropriate private counselling rooms and constraints with staff training. Notably, the availability of HIV testing commodities was high across all districts.

Figure 49: Percentage of health facilities with HCT tracer items, by district



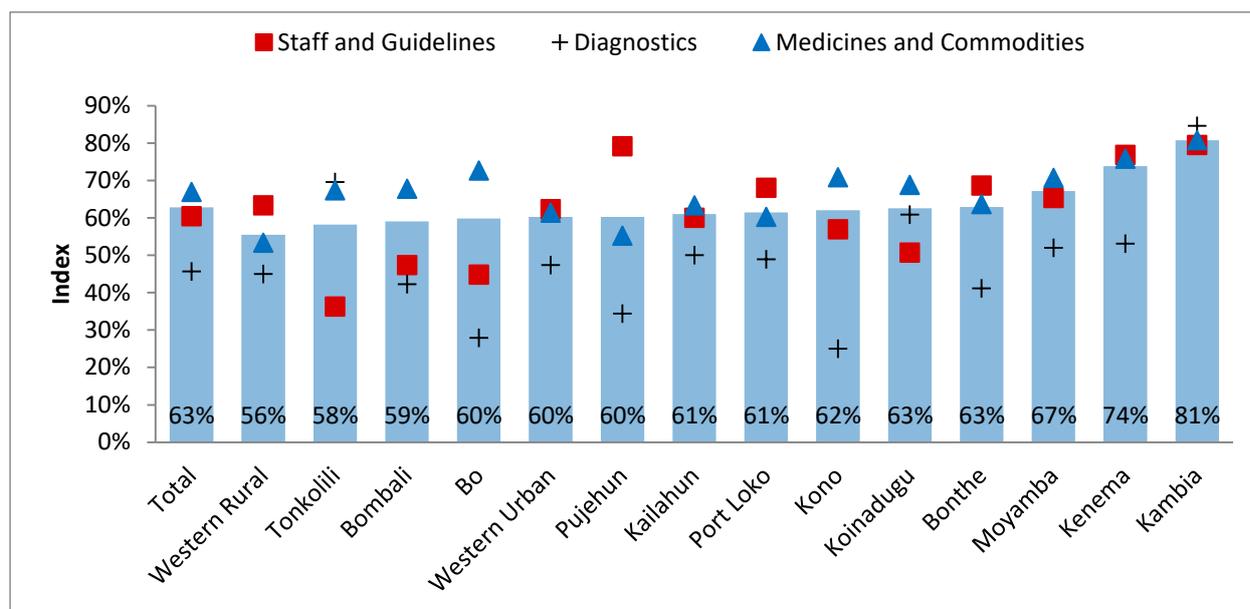
HIV care and support services were significantly unavailable across all districts, at 33% (Fig. 50). The Western urban district had the highest availability, at 56%. In all other districts, less than 44% of facilities reported offering HIV care and support services. In Kailahun district, only 14% of facilities offered the service.

Figure 50: Percentage of health facilities offering HIC care and support services, by district



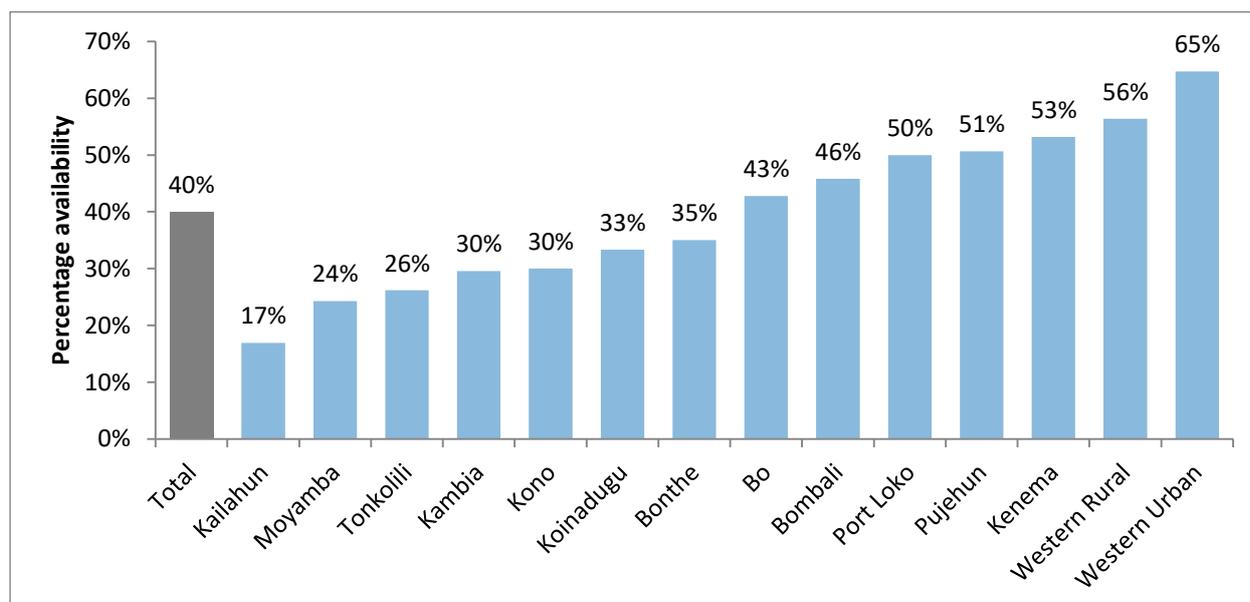
Readiness for provision of HIV care and support services: The readiness index for HIV care and support services was over 50% across all districts (Fig. 51). The greatest limitation to readiness across all districts was diagnostics services. In most districts, only 50% of facilities were ready to provide diagnostic support services for HIV care and treatment. Service readiness was highest in Kambia, where 85% of facilities were ready to provide the necessary diagnostic support for HIV care and support services.

Figure 47: Percentage of health facilities with tracer items for providing HIV care and support services (N=427)



The availability of ARV services was low; only 40% of facilities offered the service (Fig. 52). The highest availability was in the Western urban district, where 65% of facilities offered the services. It was lowest in Kailahun district, where only 17% of facilities offered the service. In four districts (Port Loko, Pujehun, Kenema and Western rural), one in every two facilities offered ARV services, whereas in Moyamba and Tonkolili, one in every four facilities offered the service.

Figure 48: Percentage of health facilities offering ARV services (N=1284)



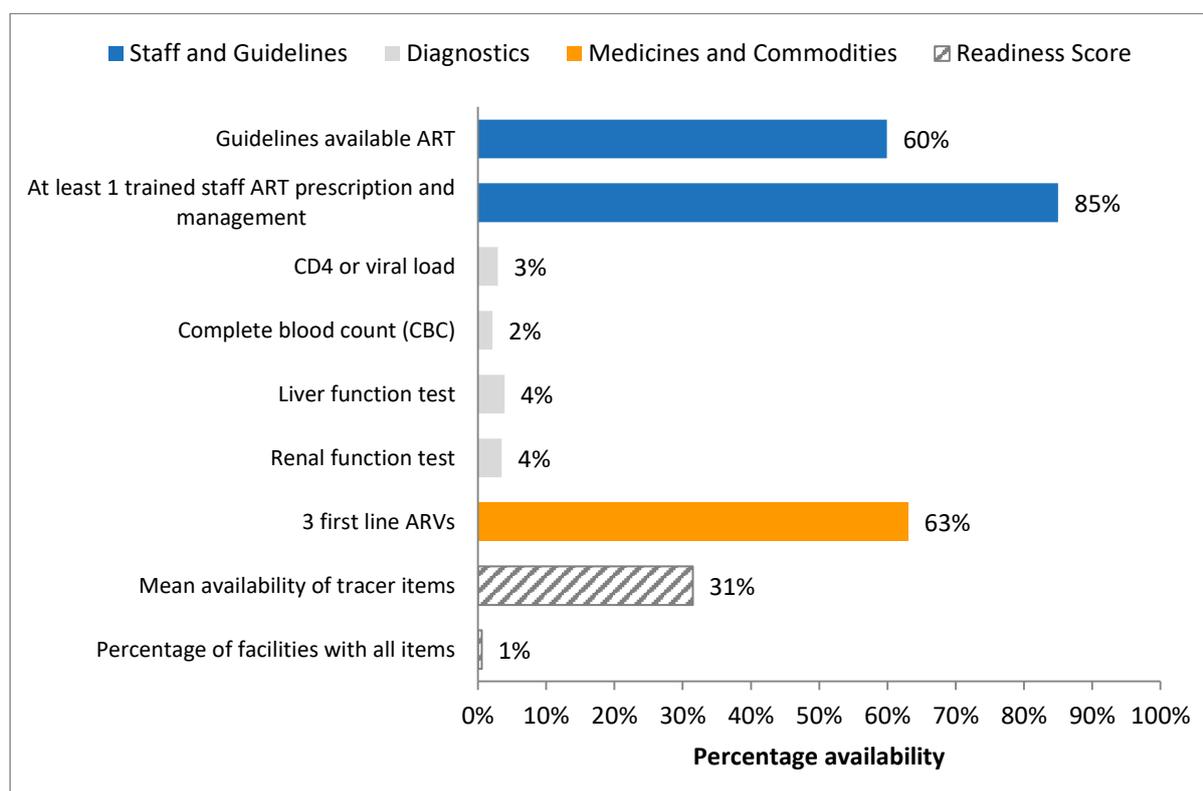
ARV services were predominantly found in hospitals and CHCs (Table 8). The service availability was low in both government and private facilities, at 40%. Two of every five facilities provided the service. ARV services were more available in urban areas; 64% of facilities offered the services, compared with rural areas, where 36% offered them.

Table 8: Availability of HIV antiretroviral services, by facility type, ownership and location

	Offers ARV prescription or ARV treatment follow-up services	ART prescription	Provide treatment follow-up services for persons on ART	Total number of facilities
Facility type				
Hospital	75%	73%	66%	56
CHC	81%	79%	77%	224
CHP	36%	30%	33%	328
MCHP	26%	22%	23%	629
Clinic	21%	17%	17%	47
Managing authority				
Government/Public	40%	36%	37%	1203
Private	40%	40%	35%	81
Urban/Rural				
Urban	64%	59%	59%	200
Rural	36%	32%	33%	1084
Total	40%	36%	37%	1284

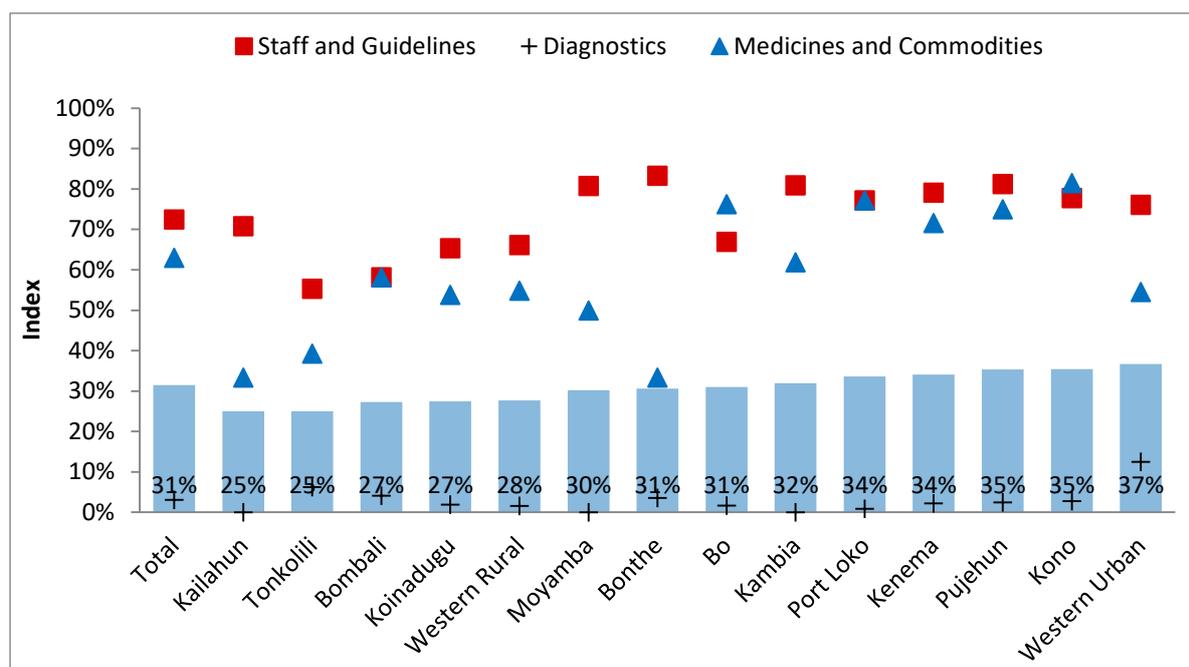
Readiness for provision of ARV services: The mean availability of tracer items for the provision of ARV services was 31% (Fig. 53). Readiness was largely reduced by the inadequacy of supportive laboratory services. CD4 count, viral load test, and liver and renal function tests were available in only 2% to 4% of the 514 facilities providing ARV services.

Figure 49: Percentage of health facilities with tracer items for offering ARV services (N=514)



In all districts, less than 3% of facilities were ready to provide diagnostic support for ARV services (Fig. 54).

Figure 50: ARV service readiness index, by district (N=514)

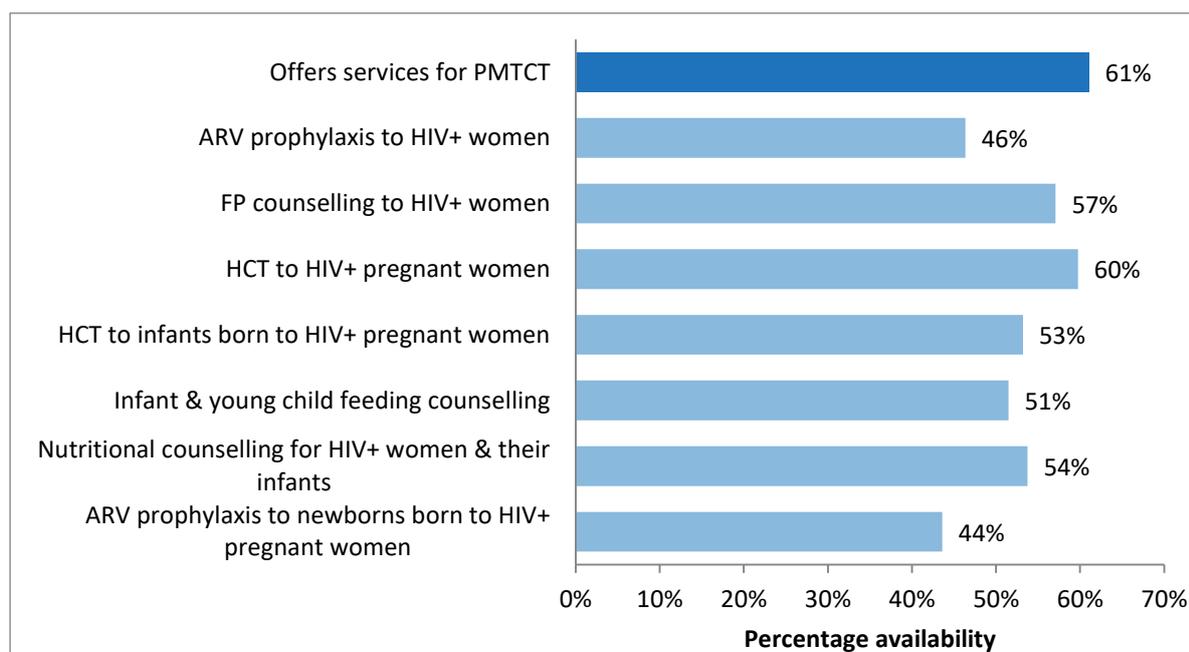


The ARV service readiness index across all districts was low. In Kailahun, 25% of facilities offering ARV services had one or a combination of the tracer items necessary. The highest was the Western urban district, where 37% of facilities had one or a combination of the tracer items. Only 1% of facilities offering ARV services had all the tracer items required to offer the service.

Availability of PMTCT services

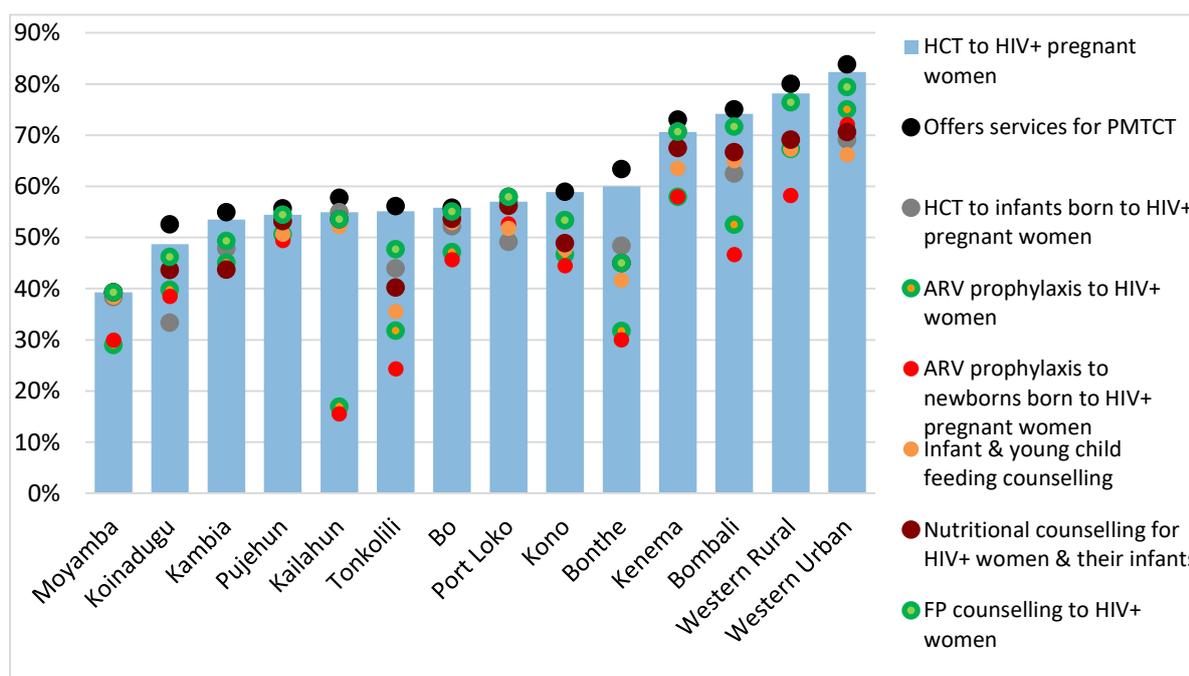
Sixty-one percent (61%) of facilities offered PMTCT services (Fig. 55). All facilities providing PMTCT services offered HCT for pregnant women. Fifty-three percent (53%) of facilities provided HCT to HIV-positive women and exposed infants. Notably, one of five facilities offering PMTCT services did not provide ARV prophylaxis to HIV-positive pregnant women and exposed infants. Half of the facilities provided nutritional counselling services to mothers and their babies.

Figure 51: Percentage of health facilities offering PMTCT services (N=1284)



The Western urban and Western rural districts had the highest availability (80% of facilities) offering HCT services to pregnant women (Fig. 56). Moyamba district had the lowest availability (40%). Ten districts had less than 60% of facilities offering the service. In ten districts, 50% of the facilities did not offer ARV prophylaxis to HIV-positive women and exposed infants.

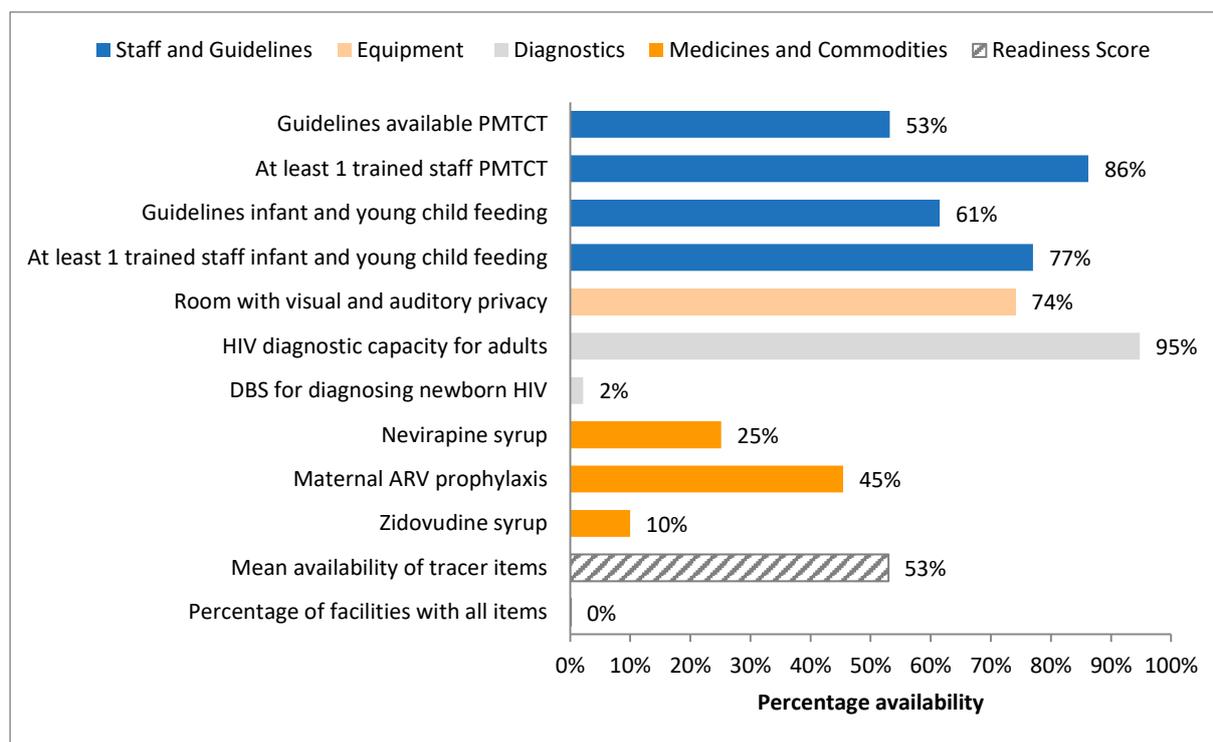
Figure 52: Percentage of health facilities offering PMTCT service continuum, by district (N=1284)



Readiness for provision of PMTCT services: Trained staff and user guidelines for PMTCT were available in 53% to 86% of the 784 facilities that offered PMTCT services (Fig. 57). One of every four facilities did not have appropriate private counselling rooms. Only 2% of PMTCT

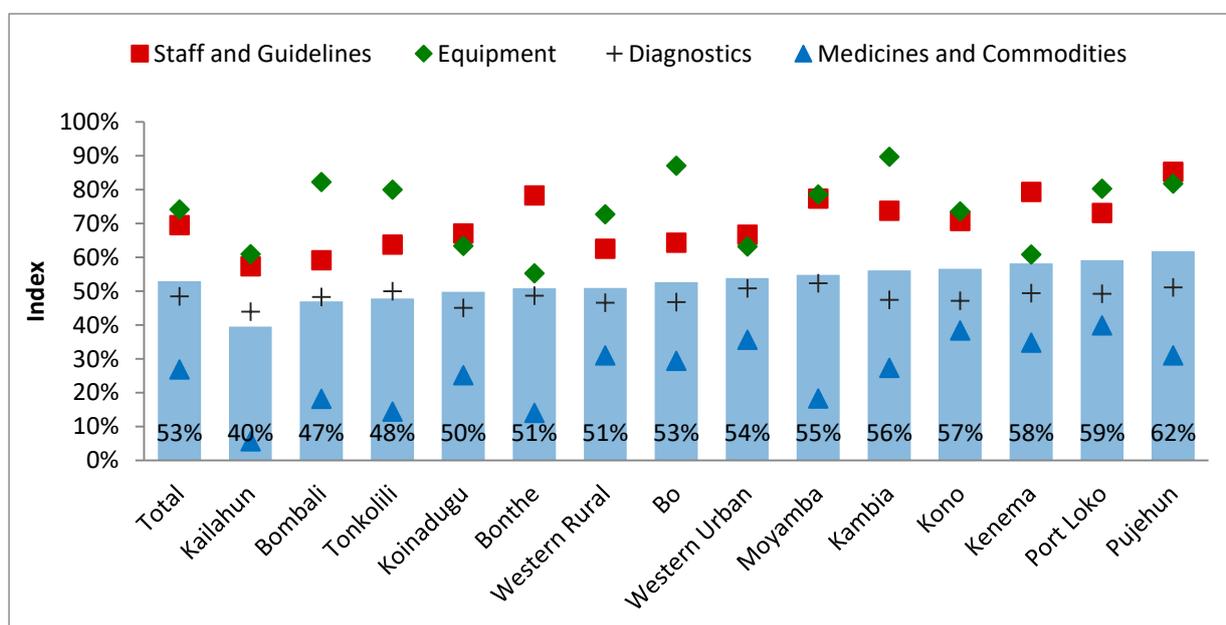
facilities offered dry blood spot (DBS) laboratory services for newborn HIV diagnosis. Less than half of the facilities had ARVs for HIV-positive mothers, whereas more than three quarters of the facilities did not have ARVs for newborns.

Figure 53: Percentage of health facilities with tracer items for PMTCT services (N=784)



The PMTCT readiness score across the districts ranged from 40% to 62% (Fig. 58). The greatest contributor to readiness was the availability of trained staff and PMTCT user guidelines. Their availability across the districts ranged from 55% to 90%. By contrast, the availability of ARVs for prophylaxis was low in all PMTCT sites, ranging from 6% in Kailahun to 38% in Pujehun.

Figure 54: PMTCT service readiness index, by district



4.5.2 Quality of care – HIV testing services

HIV testing services refer to patient-initiated testing for HIV. The quality of this service was assessed by reviewing the outpatient service documents.

The documentation of key information for HIV test clients was assessed for 410 patients from 82 facilities using record or register review. A sample of five HIV test client records was selected for each facility. The records/registers were examined for the documentation of key information, indicating that key components of HIV testing services were provided.

Figure 59 shows that the Eastern region had the weakest practices in recording HIV testing information, with HIV test result documentation not observed in an average of 10% of the records reviewed. Documentation that condoms were provided was also not consistently recorded, with an average of 66% of records across the facilities having no record that the client was offered condoms.

Figure 55: Documentation of patient care processes for HCT services

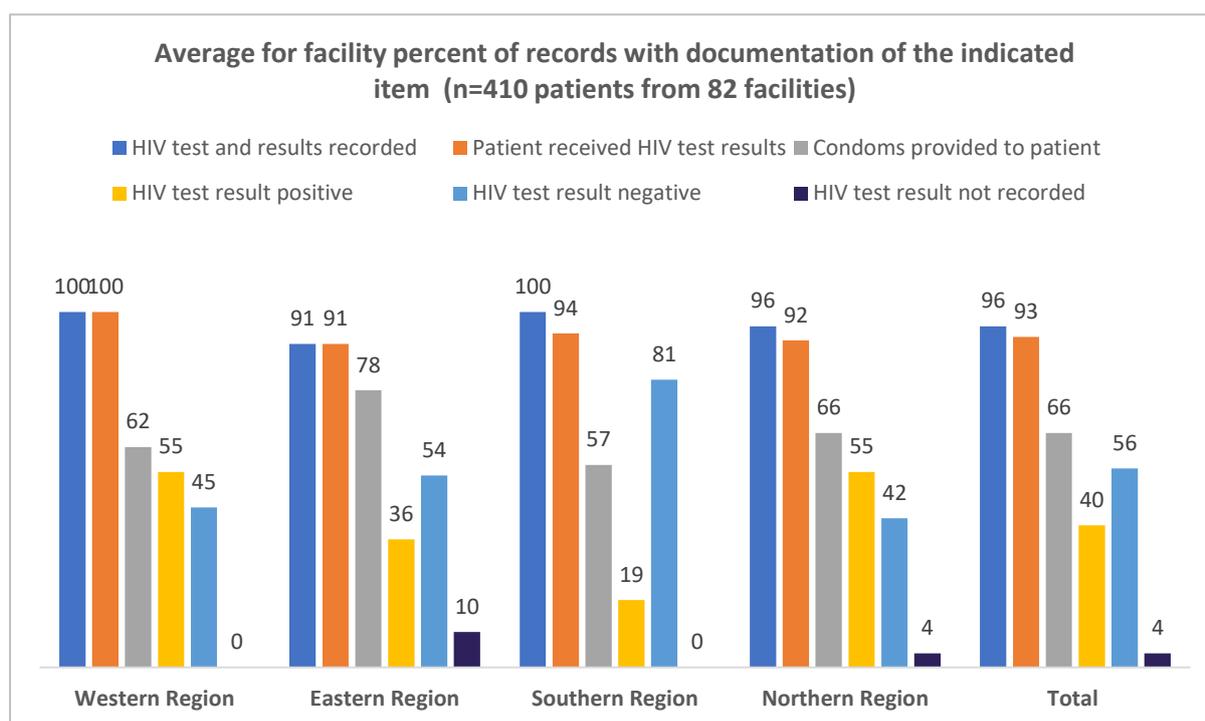


Table 9 provides a summary of the QoC indicators defined for HIV testing. On average, 95.7% of the records for clients with negative test results across the facilities had documentation that the patient had received the results. Where the data showed that the positive patient was referred for ART or care and support services and that the result was both that the patient enrolled and that the patient refused enrolment, it was assumed that the correct response was that the patient enrolled (the data collector incorrectly did not skip the question about refusal).

There was no complete documentation for patients receiving their test results, and for receiving post-test counselling. The weakest item for documentation was knowledge of the results of any referral for HIV care and support services. All positive patients should be referred to care and support for follow up, and if eligible, they would be placed on ART.

Only about half of the facilities reported that they prescribed ART (data not shown). Comparing the results for documentation of patient follow up (enrolling in care and support services or knowledge that the patient refused referral) with the availability of ART services in the facility, no consistent patterns were found.

Documentation of the distribution of condoms was not related to the availability of condoms in the HIV testing service site. Overall, the Northern region consistently scored lower for documentation of HIV testing services; this region also had the fewest resources to support services, including guidelines that would reinforce the services that were expected to be provided.

Table 9: Client health records review results for documentation of HCT processes

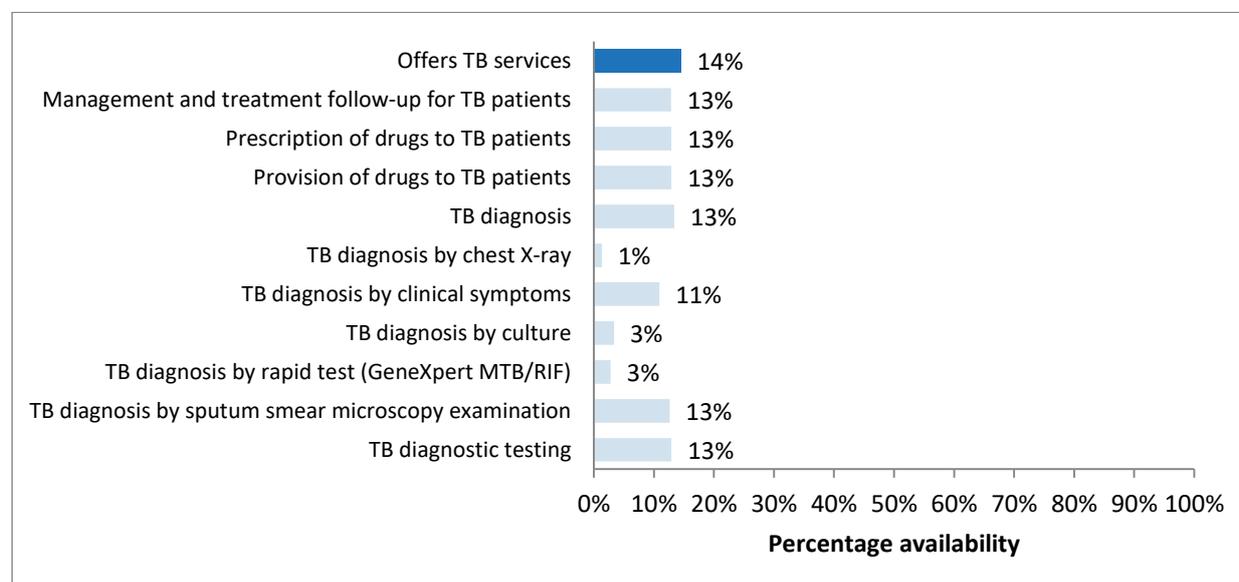
QUALITY OF CARE INDICATOR FOR HIV TESTING:										
Region (number of facilities)	Among records with an HIV test result recorded, percentage of eligible records reviewed in each facility where the indicated item was recorded									
	Negative test results (231 cases from 56 facilities)			Positive test results (164 cases from 52 facilities)						
	HIV test and results recorded ¹	Patient received HIV test results	Average facility percentage of the 2 items for HIV -	HIV test and results recorded ¹	Patient received HIV test results	Posttest counselling provided for HIV-positive patients	Referral for HIV care is documented along with result (patient enrolled or refused enrolment)		Average facility percentage of the 4 items for HIV +	Average facility percentage of records with all items for patients (410 records from 82 facilities)
							Enrolled	Refused		
(a)	(b)	(c)	(c)	(d)	(e)	(f)	(g)			
Western Region (14 facilities)	100%	100%	100%	100%	100%	100%	100%	0	100%	100%
Eastern Region (22 facilities)	100%	100%	100%	100%	100%	100%	66.7%	0	91.7%	93.3%
Southern Region (28 facilities)	100%	93.5%	93.5%	100%	95.0%	100%	100%	0	98.8%	95.0%
Northern Region (27 facilities)	100%	92.6%	92.6%	100%	100%	95.3%	86.3%	4.0%	96.4%	91.8%
Total (n=91)	100%	95.7%	95.7%	100%	97.7%	95.4%	82.5%	2.3%	94.5%	88.1%

¹ 15 cases had no test result. Positive cases required 4 items and negative cases required 2 items.

4.5.3 Tuberculosis services

The availability of TB services was very low. Nationally, only 14% of facilities offered TB services (Fig. 60). Eleven percent (11%) of facilities diagnosed TB through clinical examination. Only 1% of facilities had chest X-ray services for TB diagnosis. Three percent (3%) of facilities could do mycobacterium culture. One in every two hospitals and CHCs provided TB services.

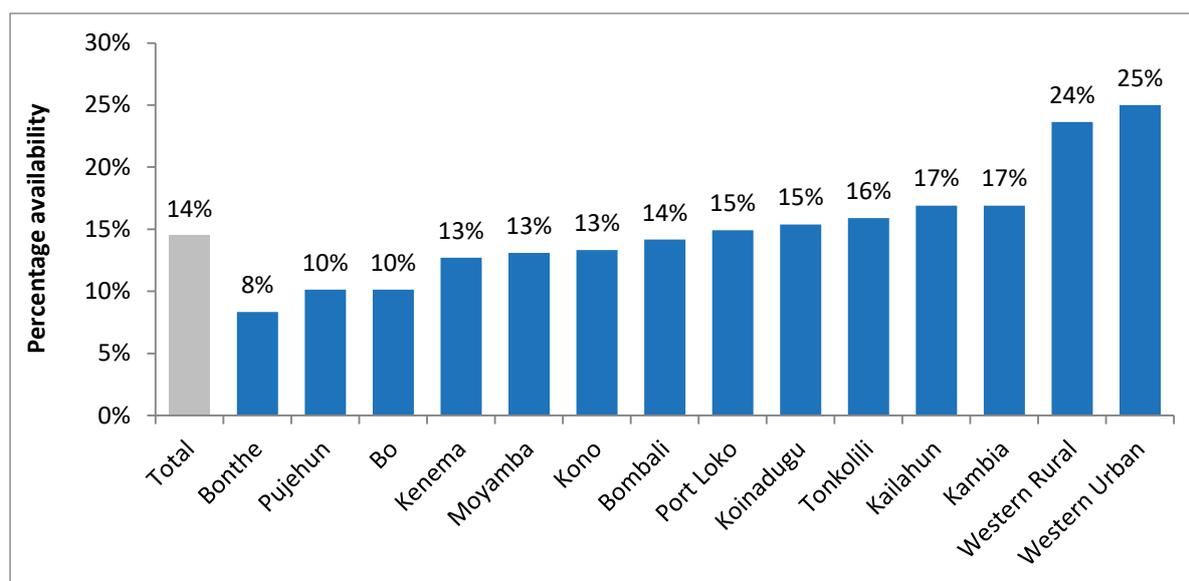
Figure 56: Percentage of health facilities offering TB services (N=1284)



	Offers TB services	Total number of facilities
Facility type		
Hospital	59%	56
CHC	50%	224
CHP	5%	328
MCHP	3%	629
Clinic	13%	47
Managing authority		
Public	14%	1203
Private	28%	81
Urban/Rural		
Urban	27%	200
Rural	12%	1084
Total	14%	1284

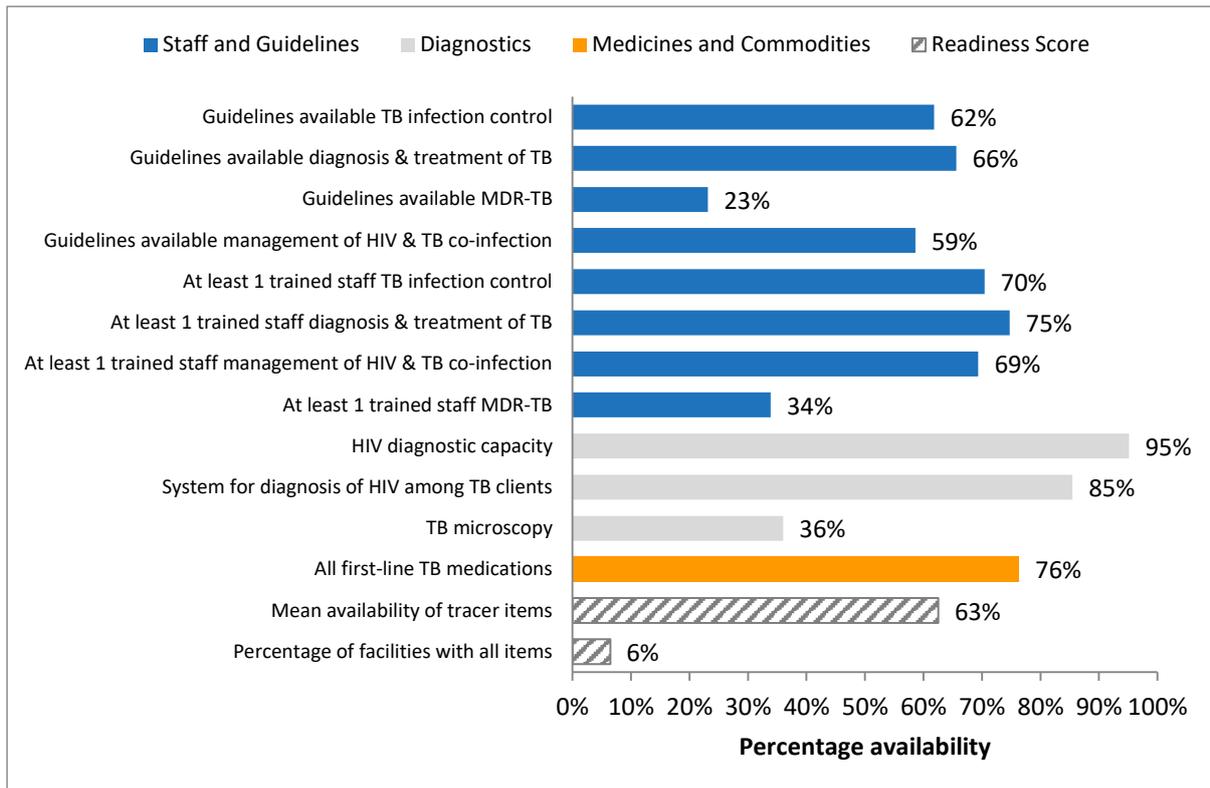
The availability of TB services across the districts was likewise very low (Fig. 61). Less than one in every five facilities in all districts provided the services, except Western urban and rural districts, where one in every four facilities provided TB services. In three districts (Bo, Bothe and Pujehun) only 8% to 10% of facilities offered TB services.

Figure 61: Percentage of facilities offering TB services, by district



Readiness for provision of TB services: Readiness among the health facilities offering TB services was mixed. It was notable that only 6% of the 186 health facilities offering TB services had all the tracer items (Fig. 62). Also notable was that one in every three TB sites did not have one or more of the readiness tracer items. The greatest limitations to the provision of TB services were laboratory services for TB microscopy, staff trained on multidrug-resistant TB (MDR-TB) and the availability of guidelines on diagnosis and treatment of MDR-TB.

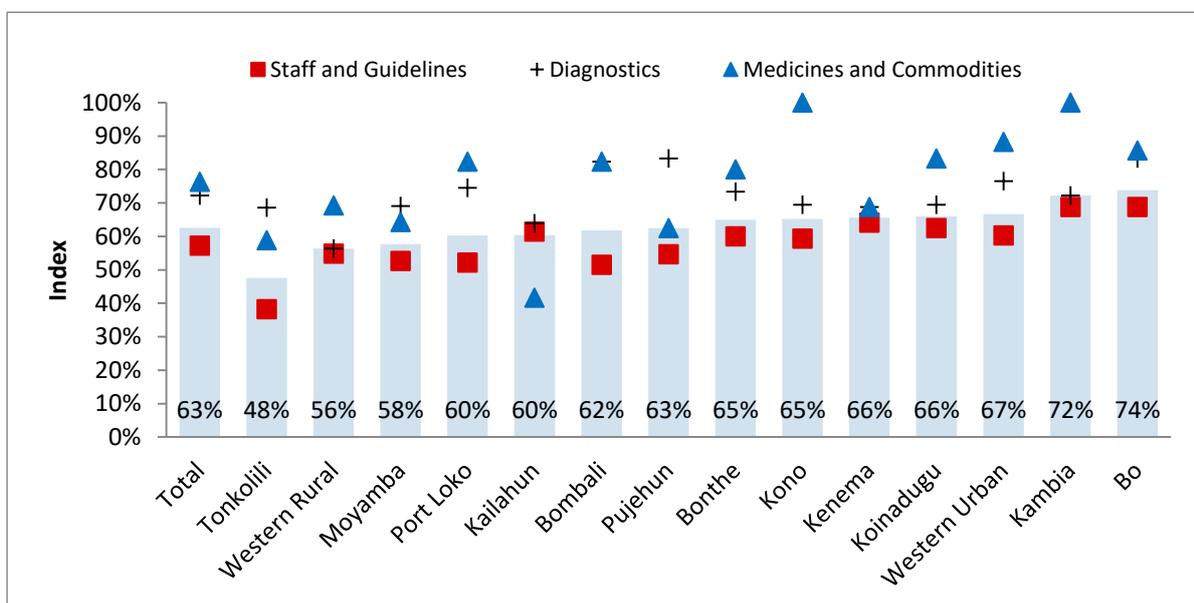
Figure 57: Percentage of facilities that had tracer items for TB services among health facilities that provided the service (N=186)



TB services were predominantly offered by government-managed CHCs. It is notable that only 4% of CHCs had all the tracer items for TB service readiness. Readiness for TB services was low in both government and private health facilities (data not shown).

TB service readiness across the districts ranged between 48% and 74% (Fig. 63).

Figure 58: Percentage of health facilities offering TB services that had tracer items for services readiness, by district (N=186)



4.5.4 Quality of care – TB

The inclusion criterion for TB patient record review was patients who had completed at least five months of TB treatment. This criterion was selected so that patients would have been on treatment for a sufficient amount of time for the QoC indicators to be applicable. Figure 64 shows the length of time that patients had been on TB treatment. In total, 207 patient records were reviewed from 43 facilities.

The record review assessed the presence of information for internationally recommended QoC indicators. There was also a SARA report (2017) that provided additional information on service availability and readiness to provide services for these facilities.

Service availability: The Western region showed the lowest performance for the package of TB services (diagnosis, treatment, patient follow up) (Table 10). Western region facilities also had the least capacity for TB diagnosis using sputum, x-ray, or culture; only 50% had the capacity to conduct TB sputum tests.

Table 10: Documentation of TB services offered and diagnostic methods used¹

Region	Number of facilities	Services reported available				Diagnostic methods reported used				
		Prescribe TB treatment	Provide TB drugs	Clinical follow up for TB patients	HIV test for TB patients	Clinical methods	Sputum smear	GeneXpert TB rapid test	Culture	X-ray
Region 1 (Western)	9	75.0%	75.0%	75.0%	87.5%	62.5%	50%	0	12.5%	0
Region 2 (Eastern)	10	100%	100%	100%	88.9%	88.9%	100%	22.2%	11.1%	22.2%
Region 3 (Southern)	9	100%	100%	100%	100%	66.7%	100%	22.2%	44.4%	11.1%
Region 4 (Northern)	15	93.3%	93.3%	86.7%	93.3%	60.0%	93.3%	20.0%	26.7%	13.3%
Summary across facilities	43	92.7%	92.7%	90.2%	92.7%	68.3%	87.8%	17.1	24.4%	12.2%

¹ Sierra Leone Service Availability and Readiness Assessment (SARA) 2017.

Time between confirmed diagnosis and beginning of treatment: Almost all patients had begun treatment within seven days of confirmed diagnosis, with a facility level average of 32% of patients starting treatment on the day of diagnosis, and an additional 60% starting treatment within the first seven days after diagnosis (Fig. 64). The Western region had a facility average of 19% documented as starting on treatment seven or more days after a confirmed diagnosis, the highest among the regions.

Figure 59: Analysis of lag time (days) between TB diagnosis and initiation of treatment

Region	Number of records reviewed	Number of completed months of treatment				Days between diagnosis and treatment beginning ³		
		5	6	11-Jul	Other ¹	0 days	1-6 days	>7 days
Western Region	37	12	20	0	5	13	17	7
						35%	46%	19%
Eastern Region		22	19	3	6	10	35	5
						20%	70%	10%
Southern Region		12	30	3	0	21	23	1
					47%	51%	2%	
Northern Region	22	49	4	0	23	49	3	
					31%	65%	4%	
Total	68	118	10	11	67	124	16	
					32%	60%	8%	

¹ 11 records in this category were entered as more than 21 months. These records were maintained with the assumption these were data entry errors and that the patient record met inclusion criteria.

² Day 0 is the day the diagnosis was confirmed

³ 1 record had missing information

Basis for diagnosis: Almost all patients across the facilities were diagnosed using two sputum smears (81%) (Table 11). GeneXpert (which also provides evidence of rifampicin sensitivity) was only used for an average of 1% of patients across facilities. The Western and Northern regions had the lowest proportions of patients in each facility who were diagnosed using two sputum samples or the GeneXpert tests, and the Western region had the highest proportion of patients across facilities diagnosed based on clinical signs and symptoms only (10%). The Northern region had the highest proportion of weak diagnostic practices, with 10% of patients across facilities being diagnosed based on only one positive sputum test and an additional 4% based on clinical findings only. The 2017 SARA survey provides evidence of readiness to provide these diagnostic services. The SARA results showed that the Western and Southern regions had the lowest diagnostic capacity, with only 13% and 11% of facilities, respectively, having the ability to perform sputum or GeneXpert tests.

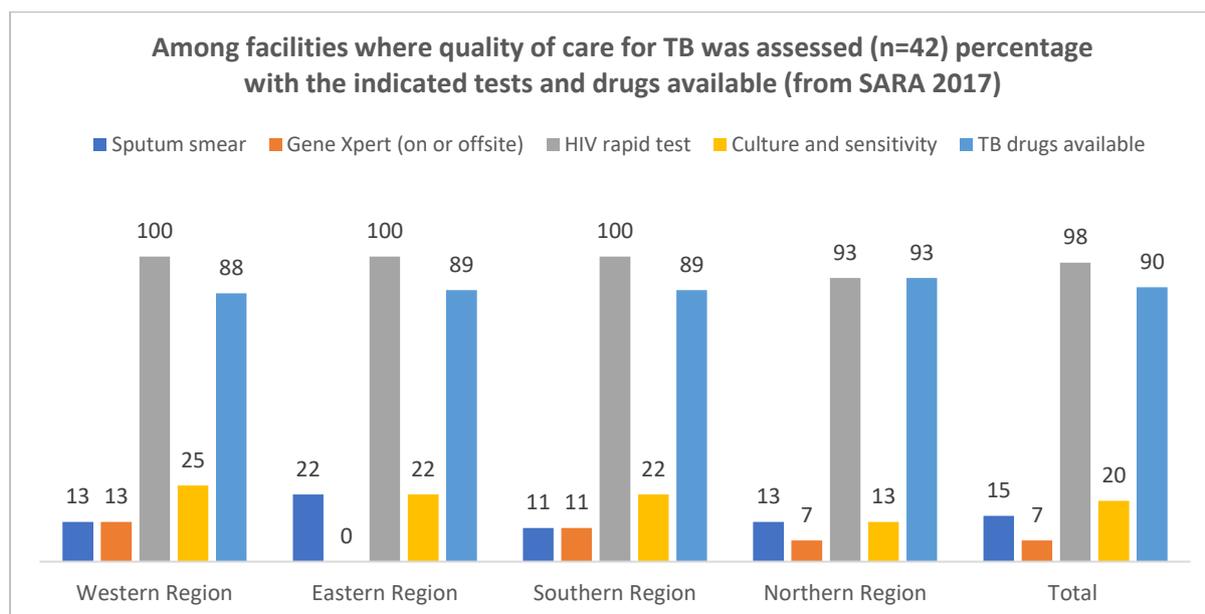
Table 11: Documentation of care process for TB clients who completed 6 months of treatment

Region	Number of records reviewed	Number of facilities	Average of the percentage of records reviewed in each facility where the indicated item was recorded										
			Basis for diagnosis				Treatment & adherence status			Rifampicin sensitivity status recorded	Recorded results for sputum monitoring		
			2 positive sputum smears	1 positive sputum smear	Diagnosis based on GeneXpert positive	Clinical criteria	Patient on correct TB treatment regimen	Treatment started within 7 days of diagnosis	Most recent drug collection on time		2 nd month of treatment	5 th month of treatment	Last month of treatment ¹ (180 cases in 40 facilities)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	
Region 1 (Western)	37	9	63%	2%	6%	10%	100%	82%	91%	20%	67%	65%	65%
Region 2 (Eastern)	50	10	100%	0	0	0	100%	90%	98%	10%	100%	82%	77%
Region 3 (Southern)	45	9	93%	6%	0	0	100%	97%	86%	0	95%	62%	57%
Region 4 (Northern)	75	15	72%	21%	0	6.7%	100%	97%	98%	13%	93%	86%	61%
Summary across facilities	207	43	81%	9%	1%	4.3%	100%	92%	94%	11%	90%	76%	65%

¹ 27 cases were not eligible for this test.

Drug availability: The full DOTS first-line treatment (INH, rifampicin, ethambutol, pyrazinamide) was available in most but not all facilities in the 2017 SARA survey. All patients whose records were reviewed were on the first-line regimen (Table 11). Ninety percent (90%) of facilities had all drugs, with a range from 88% to 89% (Western, Eastern, Southern) to 93% (Northern) (Fig. 65). **Timely drug collection** (usually requiring a patient to return to the facility periodically to collect their drugs) averaged around 90% across facilities (data not shown).

Figure 60: Availability of laboratory tests for TB diagnosis and treatment



Treatment monitoring: The record review showed that the Western region had the lowest average levels for monitoring patient sputum (Table 11). Checking for rifampicin sensitivity was rarely conducted, with a facility average of 11% of records indicating that drug sensitivity was checked. None of the records in the Southern region, and an average of 20% across facilities in the Western region (the highest level) had drug sensitivity tests recorded. Only the Northern region had GeneXpert (which also assesses rifampicin sensitivity) testing capacity (Fig. 65), although around 11% of facilities in all regions reported that they used this test (Table 11). It is possible that the facilities sent patients elsewhere for the test.

Patient clinical monitoring: Across facilities, an average of 52.4% of patient records had notes indicating that their clinical status was checked during each follow-up visit,³ with the Southern region least likely to have the notes (Table 12). Monitoring weight was most common, with a facility average of 85.7% of patient records indicating that weight was monitored (either a measured weight or a note indicating an assessment of change or consistency in the weight).

The record review identified 82 under 5 patients in 19 facilities. Among these facilities, plotting child weight was only evident in around 29.2% of cases, with the Southern and Northern regions least likely to plot child weight (0% to 3.1% facility average), and the Eastern region most likely to do so (a facility average of 70%).

³ There are usually two types of follow-up visits, visits simply to collect drugs and visits for patient assessment. The clinical assessments should be conducted during every visit for patient assessment.

Table 12: Health records review results of documentation of TB care process

	Average of the percentage of records reviewed in each facility where the indicated item was recorded for clinical visits ¹											
	Patient monitoring (all patients eligible)					Number of facilities (207 patients)	Interventions for subsets of the eligible population					
	HIV status recorded at least once	Note on clinical assessment of symptoms change or stability for each clinical visit	Weight change noted for each clinical visit ²	List of household contacts observed ⁵	Patient eligible for CXT ⁶		Among cases with HIV status recorded, those with positive HIV test result	Number of facilities with patients with HIV status recorded (194 patients)	Among positive cases, those on ART ⁴	Number of facilities with patients with HIV positive status recorded (28 patients)	Among children with weight change noted, weight plotted on growth monitoring chart ³	Number of facilities with < 5 children with weight recorded (82 patients)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	
Region 1 (Western)	85.0 %	57.5%	87.5 %	21.3 %	33.8 %	8	32.9%	7	83.3 %	6	36.0%	5
Region 2 (Eastern)	92.0 %	52.0%	98.0 %	30.0 %	20.0 %	10	12.0%	10	87.5 %	4	70.0%	5
Region 3 (Southern)	93.3 %	22.2%	62.2 %	0	6.7%	9	9.4%	9	33.3 %	3	0	1
Region 4 (Northern)	100%	68.0%	90.7 %	1.3 %	6.7%	15	10.7%	15	71.4 %	7	3.1%	8
Summary across facilities	93.8 %	52.4%	85.7 %	11.6 %	15.0 %	42	14.5	41	72.5 %	20	29.2%	19

¹ A clinical visit means the patients was assessed for status. The other type of visit is simply to pick up drugs.

² Either the weight was recorded or there was a note commenting on weight change or stability.

³ Eligible charts were those where any comment/measure about weight was recorded and the patient was < 5 years old.

⁴ Positive cases were in 13 facilities.

⁵ The contact list for each patient whose record was assessed was asked for.

⁶ Co-trimoxazole preventive therapy (CPT)

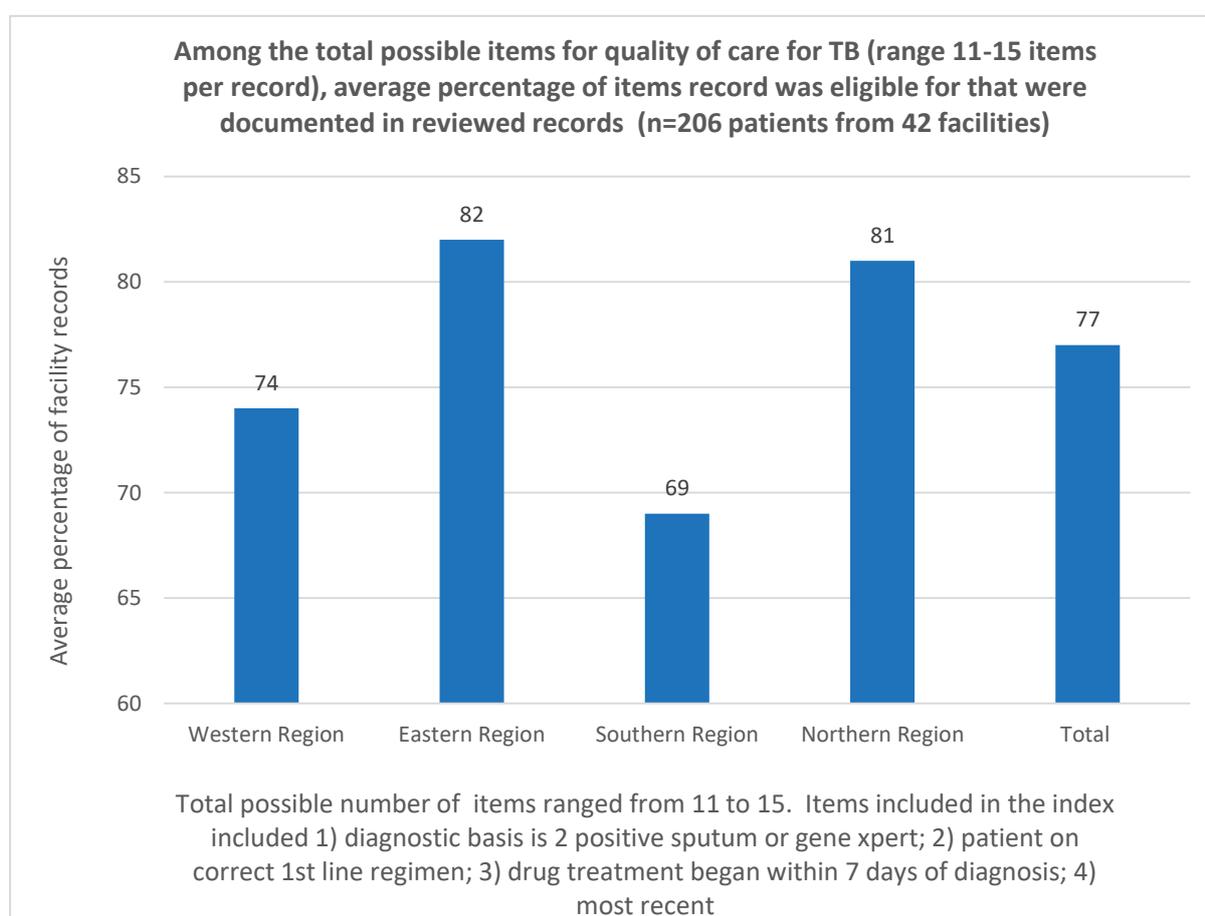
TB/HIV coinfection: The 2017 SARA survey found that 93% of facilities reported that they had a system for testing TB patients for HIV infection, and essentially all (98%) of facilities had the HIV rapid test available (Fig. 65).

The record review also showed almost universal recording (93.8% of records) of an HIV test result (Table 12). The Western region had the lowest score, with an average of 85% of records in the facilities having the HIV test result recorded. Among those with a positive test result (14.5%), there was documentation that 72.5% were enrolled in ART. The outlier was the Southern region, where only 33.3% of the HIV-positive TB patients had documentation that they were on ART.

Co-trimoxazole preventive therapy: Among the patients whose records were reviewed, an average of 15% across all facilities were eligible for CPT, with 59% documented as being on co-trimoxazole (CXT) (Fig. 66). The Southern and Northern regions had the lowest percentage of eligible patients documented on CXT (50% and 20%, respectively) (Data not shown). The 2017 SARA found that CXT was available in 73% of these facilities, ranging from 89% of facilities in the Southern region to 63% in the Western region (Table 13).

Contact listing: In most cases, there was a single register where contacts were listed, although it is possible that each patient had a listing in his/her chart. Although the listing of contacts may be individual, the follow-up of these contacts is usually a systematic process applied across all patients. A contact list was requested for each patient whose record was being reviewed. In total, only 23 patients at seven facilities had any patient contact list observed (Table 12). Among these, only one facility had contacts listed who were under 5 years old, and four of these were recorded as having received INH (data not shown).

Figure 61: Preventive interventions for TB and comprehensive care services



Support for quality services: Written guidelines and recent training are important for supporting adherence to standards of practice. Recommended monitoring practices for TB patients are to check the sputum at three and five months of treatment, and then at the end of treatment to ensure a successful cure. The 2017 SARA survey showed that the Western region had the lowest level of availability of guidelines and trained staff, and the Eastern had the highest (Table 13).

Table 13: Support for QoC and preventive interventions⁵

Region	Number of facilities	Availability of CXT	Support for QoC			
			Guidelines for		Trained staff ⁴	
			TB	TB/HIV coinfection	TB	TB/HIV coinfection
	(a)	(b)	(c)	(d)	(e)	(f)
Western	8	62.5%	50.0%	50.0%	50.0%	75.0%
Eastern	9	66.7%	88.9%	88.9%	100%	100%
Southern	9	88.9%	77.8%	66.7%	100%	100%
Northern	15	73.3%	80.0%	80.0%	73.3%	73.3%
Summary across facilities	41	73.2%	75.6%	73.2%	80.5%	85.4%

¹ Sierra Leone Service Availability and Readiness Assessment (SARA) 2017.
² At least one TB service provider reported to have received training in the subject in the past two years.

4.5.5 Malaria services

Malaria treatment services, including rapid tests and treatment, were highly available in all districts. However, laboratory microscopy services for diagnosis of malaria was very low (Table 14).

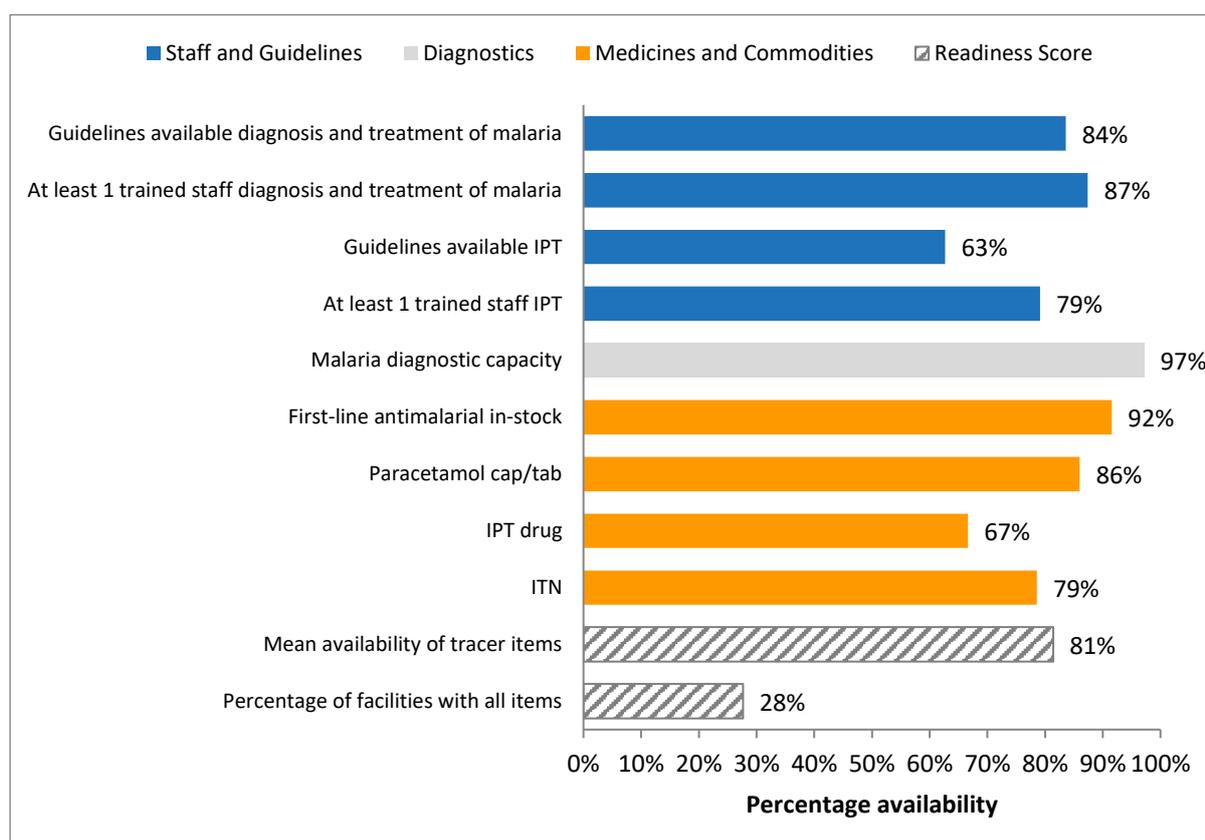
Table 14: Availability of malaria services by district, facility type and ownership

	Offer diagnosis or treatment of malaria	Malaria diagnosis	Malaria diagnosis testing	Malaria diagnosis by clinical symptoms	Malaria diagnosis by RDT	Malaria diagnosis by microscopy	Malaria treatment	IPT	Total number of facilities
Regions									
Western Urban	99%	99%	99%	82%	96%	28%	99%	91%	68
Kono	99%	99%	99%	69%	99%	6%	99%	96%	90
Port Loko	99%	99%	96%	68%	96%	6%	98%	94%	114
Bombali	99%	99%	98%	71%	98%	10%	99%	96%	120
Bo	99%	99%	98%	59%	98%	7%	99%	97%	138
Bonthe	100%	100%	98%	78%	98%	7%	98%	97%	60
Kailahun	100%	99%	99%	96%	99%	8%	100%	97%	71
Kambia	100%	100%	100%	90%	100%	4%	100%	97%	71
Kenema	100%	100%	98%	91%	97%	10%	100%	100%	126
Koinadugu	100%	100%	100%	40%	100%	6%	100%	97%	78
Moyamba	100%	100%	98%	79%	98%	2%	99%	97%	107
Pujehun	100%	100%	100%	62%	100%	3%	99%	100%	79

Tonkolili	100%	100%	99%	94%	98%	6%	99%	95%	107
Western Rural	100%	100%	100%	80%	100%	13%	100%	98%	55
Facility type									
Hospital	96%	96%	95%	82%	91%	84%	95%	79%	56
CHC	100%	100%	100%	79%	100%	13%	100%	100%	224
CHP	100%	100%	98%	77%	98%	2%	99%	98%	328
MCHP	100%	100%	99%	73%	99%	1%	100%	98%	629
Clinic	98%	96%	89%	66%	87%	28%	98%	83%	47
Managing									
Government/	100%	100%	99%	75%	99%	5%	100%	98%	1203
Private	96%	96%	91%	74%	89%	52%	95%	81%	81
Urban/Rural									
Urban	99%	99%	97%	73%	95%	25%	99%	93%	200
Rural	100%	100%	99%	76%	99%	5%	99%	97%	1084
Total	100%	100%	99%	75%	98%	8%	99%	97%	1284

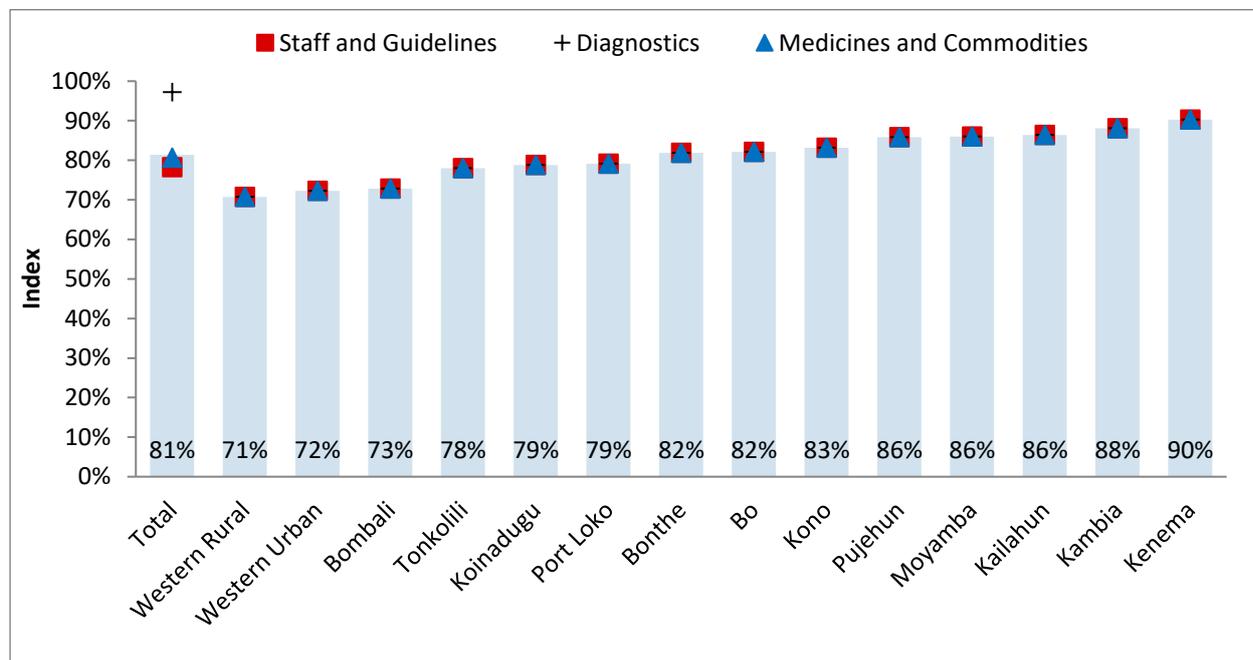
Readiness for the provision of malaria services: The facility readiness to provide malaria services was high; the mean availability of tracer items was 81% at 1279 facilities (Fig. 67). (Among the facilities surveyed, only five did not provide malaria services.) Readiness to provide malaria diagnosis and treatment in pregnancy was low. One in every three health facilities did not have the guidelines, drugs and trained staff to offer malaria services in pregnancy.

Figure 62: Percentage of health facilities with tracer items for the provision of malaria services (N=1279)



The malaria services readiness scores across districts ranged between 71% and 90%. The lowest score was in the Western rural district and the highest in Kenema district (Fig. 68).

Figure 63: Percentage of health facilities that have tracer items for malaria services, by district (N=1279)



4.5.6 Quality of care – Malaria

General malaria services refer to outpatient services during which patients with symptoms that make them “suspect” for malaria are assessed and treated. Patients with symptoms of fever, lethargy, or suspect malaria were identified from the outpatient register, and a sample of five records per facility was drawn. Records of 690 patients from 138 facilities were reviewed.

Documentation of provision of quality malaria services: Quality malaria services are defined as suspect malaria patients (for example, with fever, lethargy, other symptoms of possible malaria) being identified, having a blood test for malaria, and being treated appropriately. Appropriate treatment for positive malaria cases is to receive an ACT antimalarial in the dose appropriate for the age/weight. Appropriate treatment for negative malarial cases is to receive no antimalarial, but to have further investigation of the cause of the symptoms. The patient record should have symptoms based on history and physical exam recorded. There should also be evidence that a blood test for malaria was ordered and carried out, and the results should be available (either in the patient record or the laboratory register). There should be documentation of the drug and dosage provided to patients with positive malaria tests, and documentation showing that the patient with a negative test result was assessed for other illnesses and did not receive any antimalarial. Treatment based solely on clinical findings is not recommended by WHO.

Among the suspect malaria patient records reviewed, 93.3% received a blood test for malaria and had the result recorded (Table 15). Among all suspect malaria patients, 87.1% were found to test positive for malaria. Where there were inconsistencies in the recording of test results from the

patient record and laboratory register, the result from the patient record was assumed to be most correct, and the result that the provider acted on for treatment. The Eastern and Southern regions were less likely to have performed a malaria blood test with recorded results.

The most common method used for diagnosis among all the suspect malaria patients was the rapid malaria test (90.9%). Among other patients, 3.8% were diagnosed by blood smear, 2.8% were diagnosed using clinical signs and symptoms only, and the method for diagnosis for 2.6% of patients was uncertain (Table 15).

Table 15: Client health record review results on the quality of malaria services

Regions	Availability of malaria services		Average of the percentage of records reviewed in each facility where the indicated item was recorded							
	Number of records reviewed	Number of facilities	% of suspect malaria cases with blood parasite test result recorded	Among suspect malaria cases			Among suspect malaria with malaria test results (n=) method used for diagnosis			
				% with positive test results	% with negative results	% with no test results recorded	Rapid test	Blood smear	Clinical	Uncertain
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Western	100	20	95.0%	93.0%	2.0%	5%	90.0%	5.0%	2.0%	3.0%
Eastern	155	31	89.70%	86.5%	3.2%	10.3%	90.3%	0.6%	5.2%	3.9%
Southern	220	44	91.8%	80.9%	10.9%	8.2%	90.5%	2.3%	3.2%	4.1%
Northern	215	43	96.7%	91.2%	5.6%	3.3%	92.1%	7.0%	0.9%	0
Total	690	138	93.3%	87.1%	6.2%	6.7%	90.9%	3.8%	2.8%	2.6%

In total, 74.5% of the suspect malaria cases were treated appropriately, with test positive cases receiving the appropriate dose of ACT, and test negative cases receiving no antimalarial (Table 16). The Northern and Eastern regions had the lowest proportion of suspect malaria cases receiving appropriate treatment (less than 70%). The weakness was mostly in appropriate treatment of positive cases, where only 80.2% of the positive cases were appropriately treated. It should be noted that if the record showed that ACT was prescribed, but the dosage was not recorded, this was calculated as incorrect.

Table 16: Document review results: Quality of malaria services

Region	No. records with blood test results recorded			No. of facilities where records were reviewed	Average of the percentage of records reviewed in each facility where the indicated indicator applies			
	Positive	Negative	No blood test result		Blood parasitology test performed with documented results	Among malaria test positive, appropriate treatment provided	Among malaria test negative, no antimalarial provided	Suspect malaria cases managed appropriately ^{1,2}
					690 records in 138 facilities	602 records in 134 facilities	62 records in 31 facilities	n=690
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Western	93	2	5	20	95.0%	86.0%	100%	83.0%
Eastern	134	5	16	31	89.7%	76.7%	100%	69.0%
Southern	178	24	18	44	91.8%	96.3%	91.7%	87.7%
Northern	196	12	7	43	96.7%	63.5%	75.0%	60.9%
Total	601	43	46	138	93.3%	80.2%	88.4%	74.5%

¹ Suspect malaria patient had blood parasitology results documented, positive test results were treated appropriately, and negative test results received no antimalarial.

On average, 21% of the records assessed did not show malaria positive cases being correctly treated (Table 17). This was due to no ACT being prescribed (0.8%); incorrect ACT dosage recorded (15.3%); the ACT dosage not being recorded (4.5%); provision of another antimalarial and ACT with the wrong dose or dose not recorded (9.8%). However, on average, 2.3% of patients who had a positive malaria test and received the correct dose of ACT were also prescribed an additional antimalarial drug. The Northern region had the highest proportion of test positive cases receiving an incorrect dose of ACT (36.1%) and the Eastern region had the highest proportion of cases where the ACT dose was not recorded (13.8%).

Among the few test negative cases (n=62), 88.4% did not receive any antimalarial (Table 16). The remaining cases were prescribed ACT. No antimalarial other than ACT was recorded for negative cases.

Table 17: Client record review results on the management of malaria positive patients

Region	No. records reviewed with positive results	No. of facilities with positive result records reviewed	Average of the percentage of records with a positive test result recorded where the indicated incorrect treatment was recorded (n=601)					Test positive malaria cases managed appropriately ¹
			No ACT prescribed	Incorrect ACT dosage	ACT dose not recorded	Another antimalarial with ACT (dose not recorded or wrong dose recorded) ³	Among test positive managed appropriately, those that received another antimalarial in addition to ACT ²	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Western	93	20	4.5%	9.5%	4.5%	18.0%	0%	86.0%
Eastern	134	29	0%	9.5%	13.8%	16.2%	4.1%	76.2%
Southern	178	43	0%	1.5%	2.2%	3.6%	0.5%	96.3%
Northern	196	42	0.5%	36.1%	0.5%	8.0%	3.9%	63.5%
Total	601	134	0.8%	15.3%	4.5%	9.8%	2.3%	80.2%

¹ Suspect malaria patient had blood parasitology results documented, positive test results were treated with ACT at appropriate dose.

² The indicator definition for appropriate treatment does not mention if another antimalarial is prescribed.

³ There were no instances of test positive cases receiving no ACT and receiving another antimalarial.

Resources available: Not surprisingly, the use of malaria smears for diagnosis was higher in the regions that had higher availability of malaria smear capacity (Western and Northern) (Table 18). These regions also had higher rates of RDT stockouts in the past four weeks (11.1% and 9.3%, respectively) and ACT stockouts (11.1% and 7%, respectively). All regions reported stockouts of RDTs in the past four weeks; however, the RDTs were available across 94.1% of the facilities on the day of the SARA.

Table 18: Resources and services for malaria diagnosis and treatment in the facilities assessed for QoC¹

Region	# of facilities linked in SARA and QoC	Malaria smear capacity ²	Rapid test onsite	Stockouts of RDTs in past 4 weeks	Prescribes malaria treatment	Malaria guidelines observed	At least 1 malaria service provider trained in past 2 years		ACT drug	
							Malaria diagnosis	Malaria treatment	Available today	Stockout in past 4 weeks
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Western	18	16.7	88.9	11.1%	100%	83.3%	88.9%	88.9%	66.7%	11.1%
East	29	6.9%	96.6	3.4%	100%	89.7%	82.8%	82.8%	96.6%	3.4%
South	46	4.3%	95.7	6.5%	100%	87.0%	89.1%	93.5%	95.7%	0
North	43	9.3%	93.0	9.3%	100%	79.0%	93.0%	95.3%	90.7%	7.0%
Total	136	8.1%	94.1	7.4%	100%	84.6%	89.0%	91.2%	90.4%	4.4%

¹ Sierra Leone Service Availability and Readiness Assessment (SARA) 2017.

² Functional light microscope with slides and covers, and a stain for malaria (for example, Wright-Giemsa)

4.6 Non-Communicable diseases

4.6.1 Availability of diabetes services

Table 19: Availability of diabetes services

	Diabetes diagnosis and/or management	Total number of facilities
Facility type		
Hospital	79%	56
CHC	25%	224
CHP	5%	328
MCHP	2%	629
Clinic	34%	47
Managing authority		
Government/Public	9%	1203
Private	52%	81
Urban/Rural		
Urban	34%	200
Rural	7%	1084
Total	11%	1284

Diagnosis and treatment of diabetes was available at 79% of the hospitals (Table 19). One of every four CHCs and one of every three clinics provided diabetes services. Fifty-two percent (52%) of private facilities provided diabetes services compared with only 9% of government-managed facilities. In the urban areas, one of every three health facilities offered diabetes services compared with one of every ten facilities in rural areas.

4.6.2 Availability of cardiovascular disease services

Table 20: Availability of cardiovascular disease services

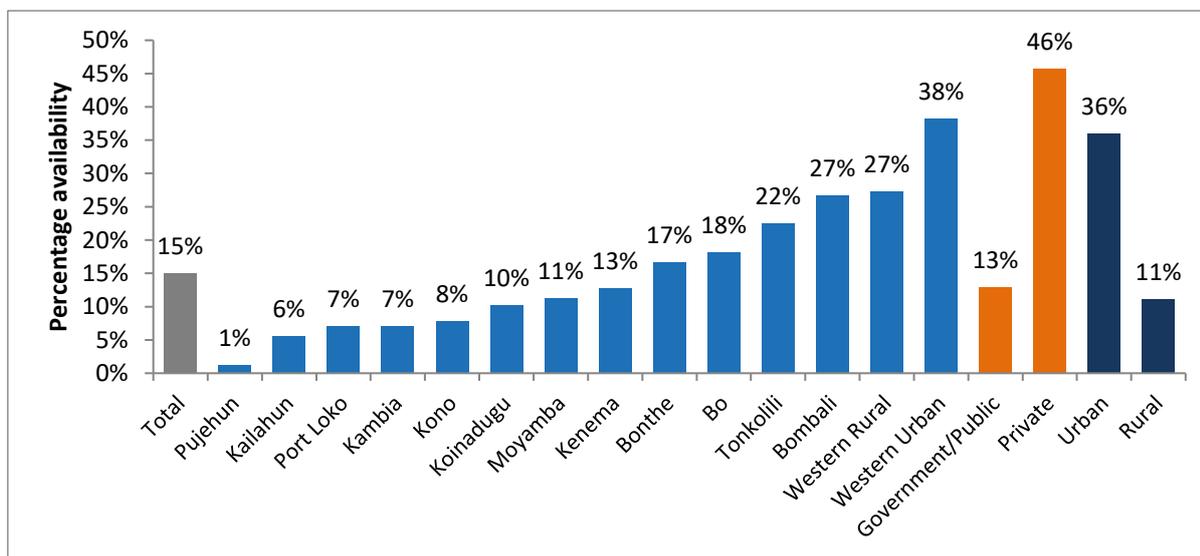
	Offers cardiovascular disease diagnosis and/or management	Total number of facilities
Facility type		
Hospital	75%	56
CHC	36%	224
CHP	17%	328
MCHP	10%	629
Clinic	36%	47
Managing authority		
Government/Public	17%	1203
Private	56%	81
Urban/Rural		
Urban	45%	200
Rural	15%	1084
Total	20%	1284

Seventy-four percent (75%) of hospitals offered services for the management and diagnosis of hypertensive disease (Table 20). Private health facilities were more likely to offer diagnosis and management of hypertension; 56% of private facilities offered the service compared with 17% of government facilities. Two of every five health facilities in the urban areas offered services for the diagnosis and management of hypertension, compared with their availability at rural facilities, where only one of every six facilities offered the services.

4.6.3 Availability of chronic respiratory disease services

Services for the diagnosis and management of chronic respiratory diseases were available at 15% of the 1284 facilities assessed (Fig. 69). The availability by facility type was: 74% of the hospitals; 32% of the CHCs; 27% of the clinics; and 9% and 6% of the CHPs and the MCHPs, respectively. The availability of services across districts was highest in the Western urban district, where one of every three facilities offered diagnosis and management services for chronic respiratory disease. The service was primarily available at private health facilities located in the urban areas.

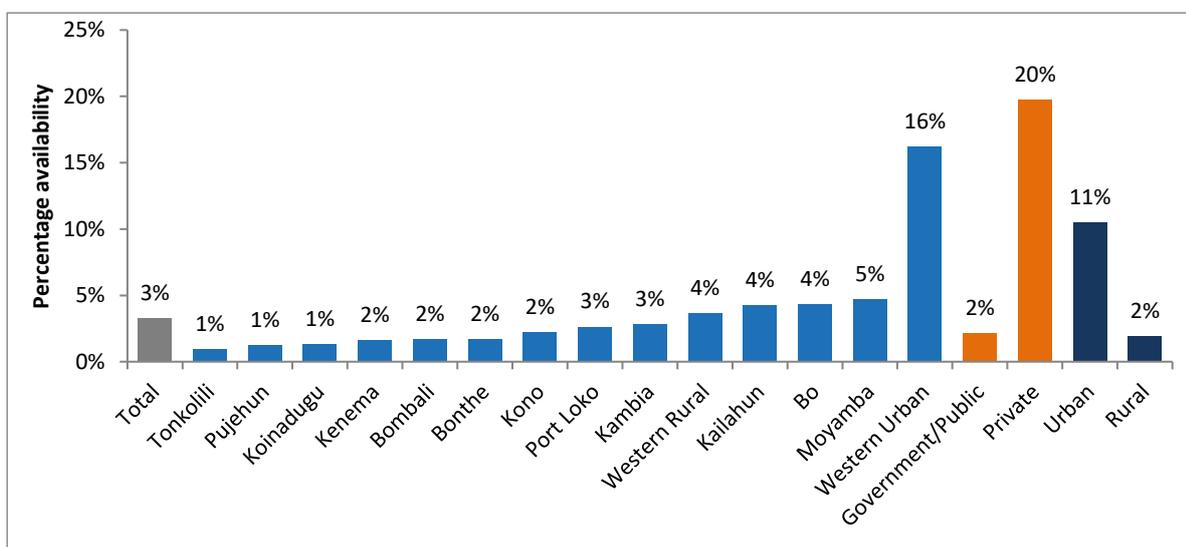
Figure 64: Percentage of health facilities offering respiratory disease services, by district (N=1284)



4.6.4 Availability of cervical cancer services

The availability of diagnostic services for cervical cancer was low. Three percent (3%) of the 1284 facilities reported offering the service nationally (Fig. 70). Only 2% of 1203 government primary health care facilities, and especially those in rural areas, offered the service. Two of every five hospitals, predominantly in urban areas, offered diagnosis and management services for cervical cancer.

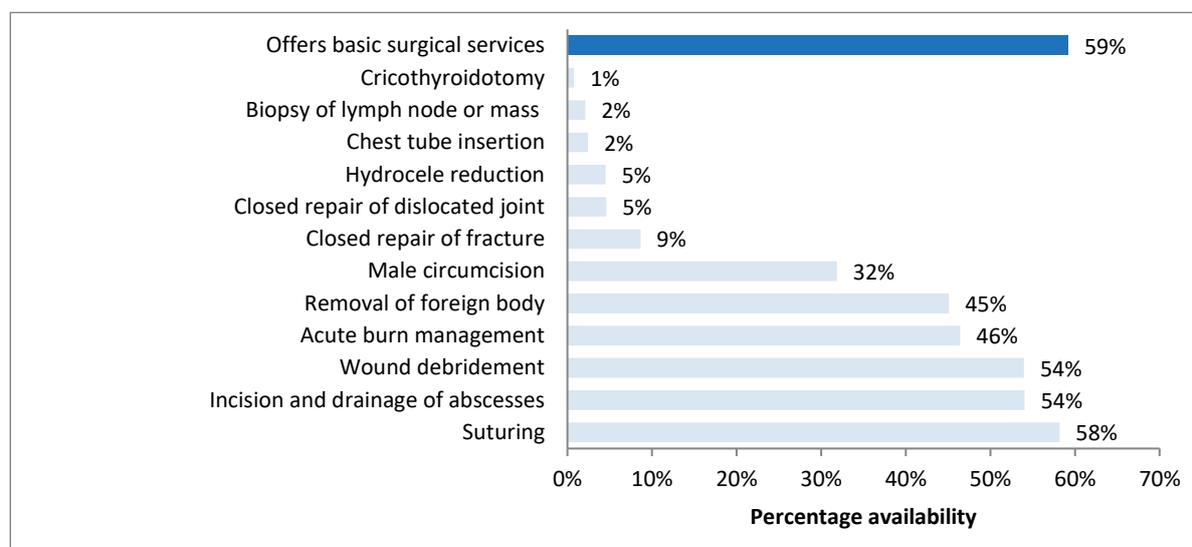
Figure 65: Availability of cervical cancer services, by district (N=1284)



4.7 Surgical services

4.7.1 Basic surgical services

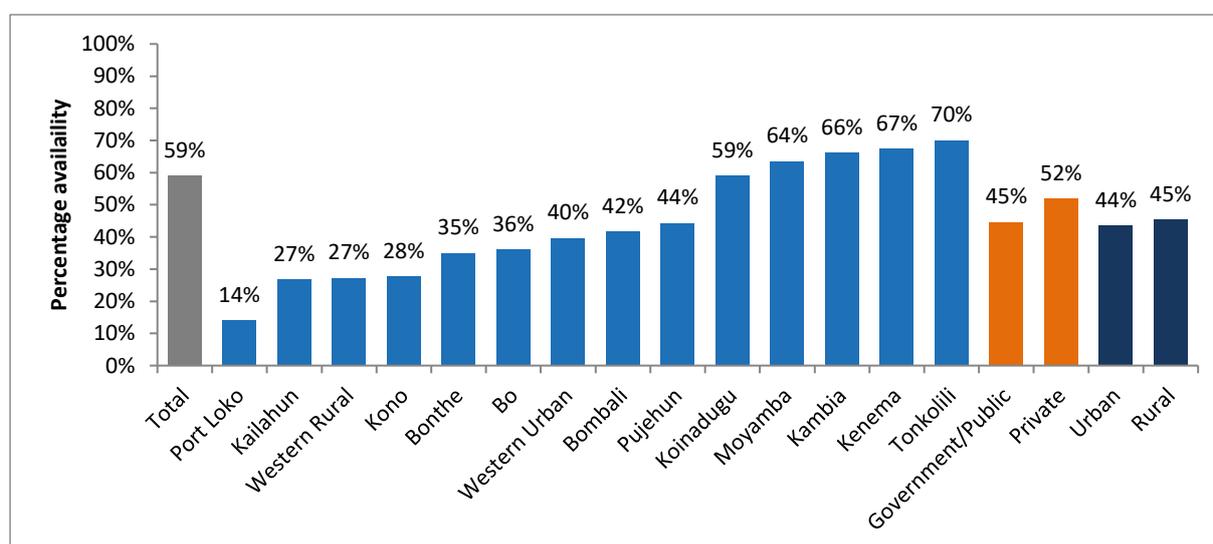
Figure 71: Availability of basic surgical services (N=1284)



Basic surgical services were not generally available across all health facilities. Fifty-nine percent (59%) of the 1284 facilities offered the service nationally (Fig. 71), and primarily at hospitals, where nine of every ten provided basic surgical services (data not shown). The primary health care facilities did not offer complex surgeries, such as cricothyroidotomy, chest tube insertion or lymph node biopsy (Fig. 71). However, 54% of the primary health care facilities offered incision and drainage of abscesses and suturing.

The national average availability of surgical services was 59% (Fig. 72). District variations were wide, ranging between 14% in Port Loko and 70% in Tonkolili. There were no variations seen between urban and rural facilities. Proportionately, more private facilities had surgical services available than public health facilities.

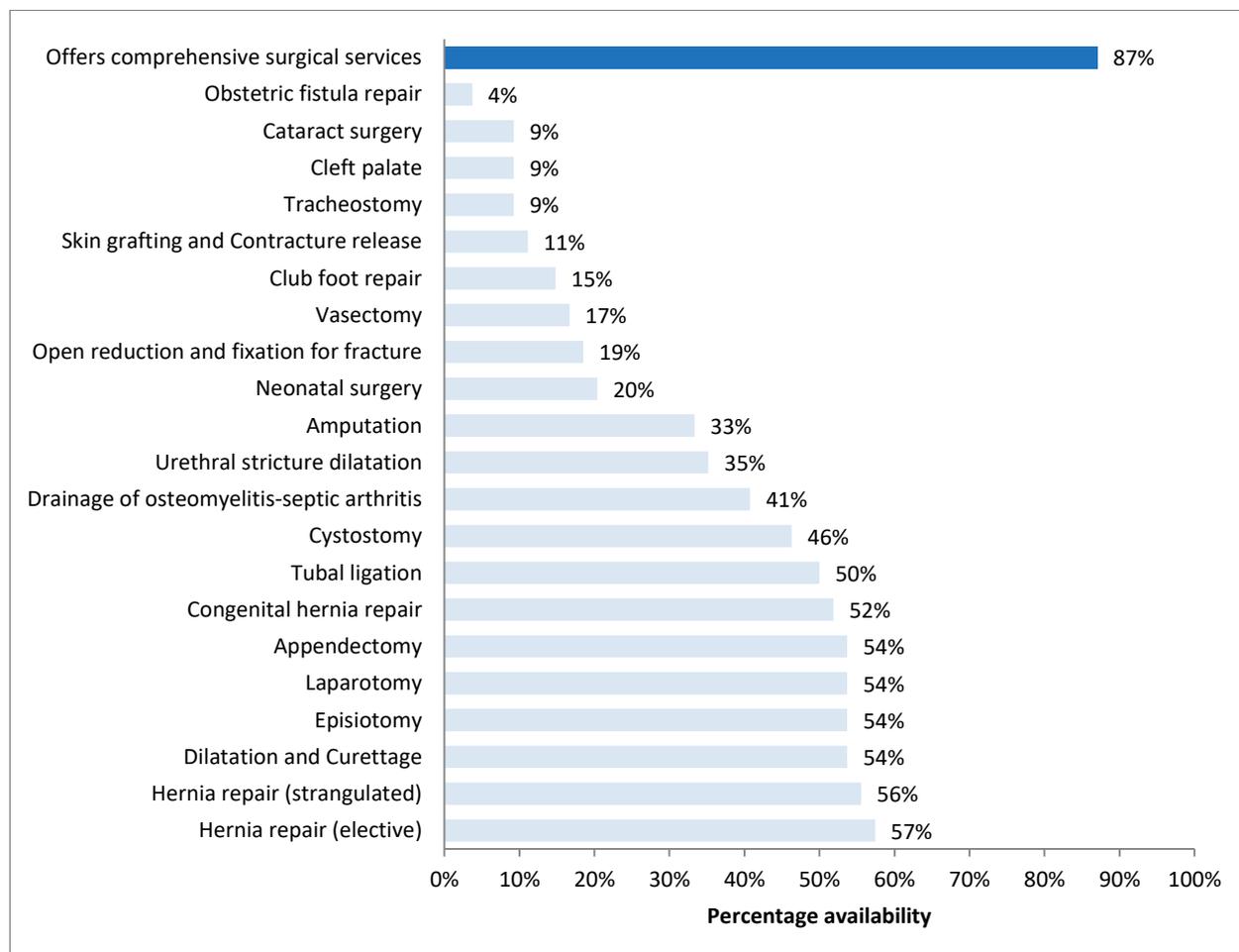
Figure 66: Percentage of health facilities offering basic surgical services, by district



4.7.2 Comprehensive surgical services

Hospitals are expected to offer comprehensive surgical services. Fifty-four (54) hospitals were assessed and 87% reported offering comprehensive surgical services (Fig. 73). However, reporting on the availability of specific surgical procedures ranged between 4% of hospitals offering obstetric fistula repair to 57% of hospitals offering elective hernia repair.

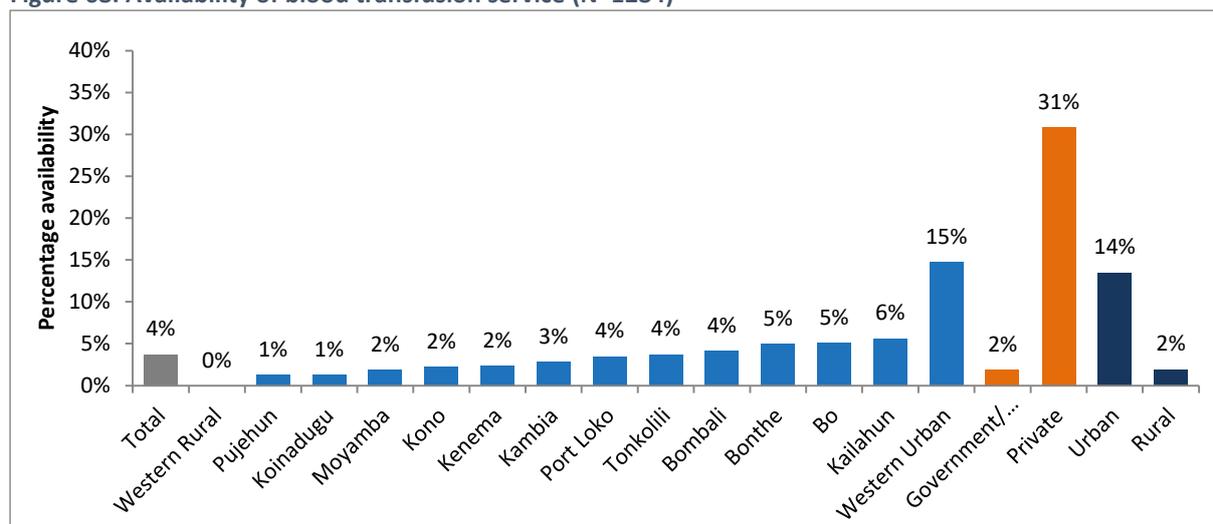
Figure 67: Availability of comprehensive surgical services in hospitals (N=54)



The availability of comprehensive surgical services was spread across all districts. However, in Kambia and Western rural districts, 50% of hospitals did not offer comprehensive surgical services (data not shown).

4.8 Blood transfusion services

Figure 68: Availability of blood transfusion service (N=1284)

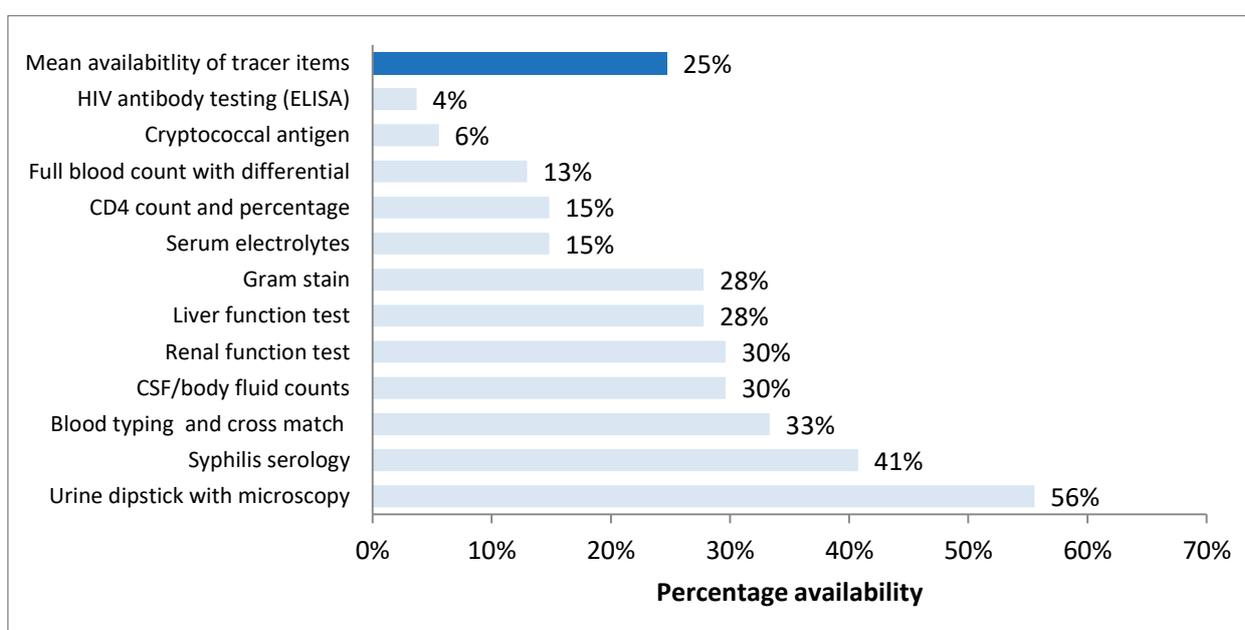


Blood transfusion services were very low nationally (Fig. 74). The greatest availability was in the Western urban district, where one in every six of the 68 facilities provided blood transfusion services. Eighty-one (81) private health facilities were assessed; one of every three offered the service. Blood transfusion services were low in both urban and rural areas; 14% and 2% of the facilities, respectively, offered the service.

4.9 Diagnostic services

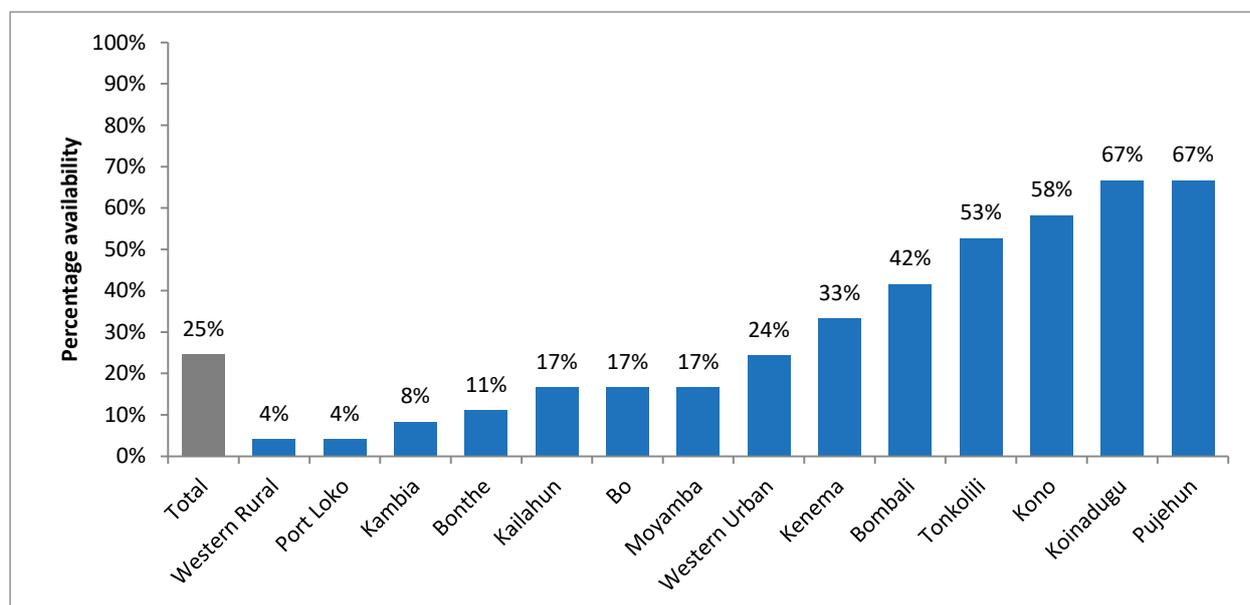
4.9.1 Advanced diagnostic services

Figure 69: Availability of advanced diagnostic services in hospitals (N=54)



Fifty-four hospitals (54) were assessed for the availability of advanced diagnostic services. On average, one in every four offered services (Fig. 75). Over half of the facilities could perform urine dipstick tests. About one in every three facilities offered blood assays, such as renal and liver function tests, and cerebral spinal fluid (CSF) counts. Immunology tests were rare at the 54 facilities. Only 4% offered HIV antibody tests; 6% offered cryptococcal antigen; and 15% offered CD4 count tests.

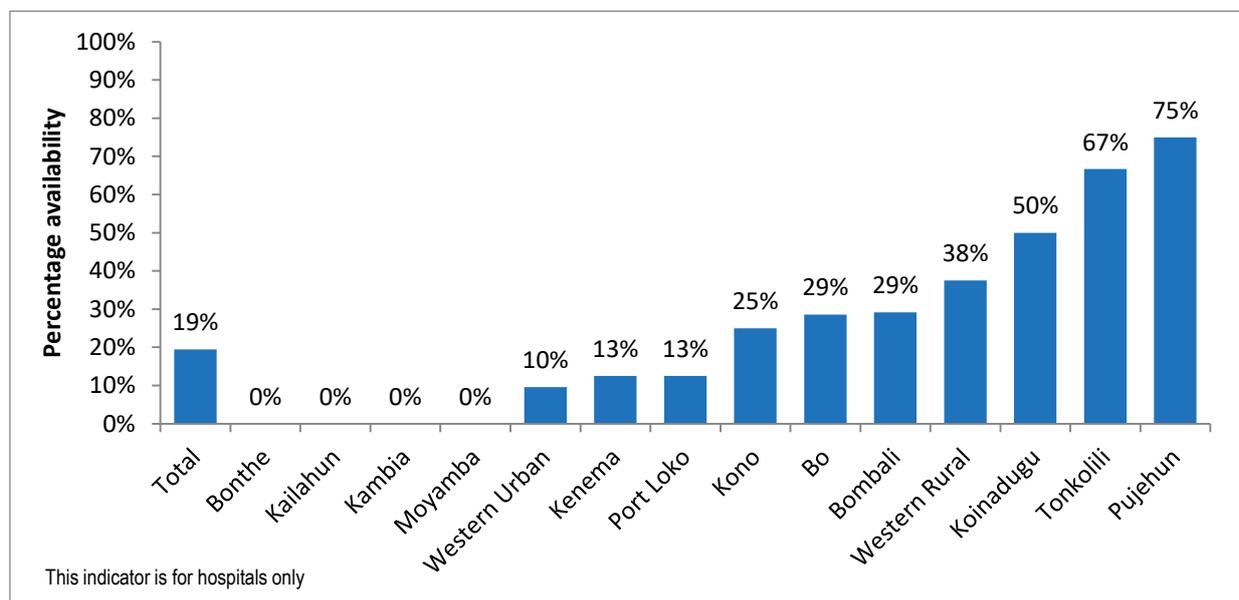
Figure 70: Percentage of hospitals offering advanced diagnostic services (N=54)



The availability of advanced diagnostic services was highest in Tonkolili, Kono, Koinadugu and Pujehun districts, where more than half of the facilities assessed offered the services (Fig. 76).

4.9.2 Availability of high-level diagnostic equipment

Figure 71: Percentage of hospitals that had high-level diagnostic equipment, by district (N=52)



The availability of high-level diagnostic equipment assessed the presence of an ultrasound machine, X-ray equipment, electrocardiograph (ECG) machines and CT scan machines at the facilities. Pujehun was the only district that had all the equipment, except for the ECG machines (Fig. 77). The CT scan machine was the least available diagnostic equipment. Only two were available, one each in Pujehun and Tonkolili. Four districts (Bonthe, Kailahun, Kambia and Moyamba) had none of the diagnostic equipment.

4.10 District fact sheets

The district factsheets summarize service availability and readiness scores compared to scores at the national level.

Bo District

Mean availability of services		Bo	National
1.	Diagnostic capacity ⁴	29%	33%
2.	FP services	96%	96%
3.	ANC services	97%	97%
4.	Obstetric signal functions	71%	76%
5.	Newborn signal functions	60%	60%
6.	Preventive and curative care for under-five children	98%	98%
7.	Caesarean section	3%	5%
8.	Comprehensive emergency obstetric care	2%	2%
9.	Child immunization services	96%	95%
10.	Diagnosis or treatment of malaria	99%	100%
11.	TB services	10%	14%
12.	HCT services	54%	62%
13.	HIV care and support services	44%	33%
14.	ARV prescription or ARV treatment follow-up services	43%	40%
15.	Services for PMTCT	56%	61%
16.	Diagnosis/treat child malnutrition	85%	88%
17.	Blood transfusion services	5%	4%
18.	Basic surgical services	36%	59%
19.	Staff providing FP services trained in adolescent sexual and reproductive health	66%	77%
Total number of facilities		138	1284

Service Readiness score		Bo	National
1	FP service	73%	76%
2	ANC service	64%	66%
3	Comprehensive obstetric care service	66%	44%

⁴ Mean availability of haemoglobin, blood glucose, malaria diagnostic capacity, urine dipstick-protein, urine dipstick-glucose, HIV diagnostic capacity, syphilis rapid test, and urine test for pregnancy.

4	At least one staff trained in essential childbirth care	73%	85%
5	Staff trained in newborn resuscitation	77%	88%
6	Child immunization services	64%	68%
7	Child health preventive and curative care services	79%	74%
8	Malaria service	82%	81%
9	Tuberculosis service	74%	63%
10	HCT service	82%	82%
11	HIV/AIDS care and support service	60%	63%
12	HIV/AIDS ARV service	31%	31%
13	HIV/AIDS: PMTCT service	53%	53%

Bombali District

Mean availability of services		Bombali	National
1	Diagnostic capacity	36%	33%
2	FP services ⁵	92%	96%
3	ANC services	95%	97%
4	Obstetric signal functions	75%	76%
5	Newborn signal functions	60%	60%
6	Preventive and curative care for under-five children	95%	98%
7	Caesarean section	23%	5%
8	Comprehensive emergency obstetric care	3%	2%
9	Child immunization services	91%	95%
10	Diagnosis or treatment of malaria	99%	100%
11	TB services	14%	14%
12	HCT services	78%	62%
13	HIV care and support services	38%	33%
14	ARV prescription or ARV treatment follow-up services	46%	40%
15	Services for PMTCT	75%	61%
16	Diagnosis/treat child malnutrition	82%	88%
17	Blood transfusion services	4%	4%
18	Basic surgical services	42%	59%
19	Staff providing FP services trained in adolescent sexual and reproductive health	57%	77%
Total number of facilities		120	1284

Service Readiness score		Bombali	National
1	FP service	73%	76%

⁵ Mean availability of combined oral contraceptives, progestin-only contraceptives, combined injectable contraceptives, progestin-only injectable contraceptives, male condoms, female condoms, IUCD, implant, cycle beads for standard days method, emergency contraceptive pills, male sterilization and female sterilization.

2	ANC service	63%	66%
3	Comprehensive obstetric care service	17%	44%
4	At least one staff trained in essential childbirth care	82%	85%
5	Staff trained in newborn resuscitation	81%	88%
6	Child immunization services	67%	68%
7	Child health preventive and curative care services	76%	74%
8	Malaria service	73%	81%
9	Tuberculosis service	62%	63%
10	HCT service	84%	82%
11	HIV/AIDS care and support service	59%	63%
12	HIV/AIDS ARV service	27%	31%
13	HIV/AIDS: PMTCT service	47%	53%

Bonthe District

Mean availability of services		Bonthe	National
1.	Diagnostic capacity	31%	33%
2.	FP services	95%	96%
3.	ANC services ⁶	97%	97%
4.	Obstetric signal functions	79%	76%
5.	Newborn signal functions	58%	60%
6.	Preventive and curative care for under-five children	98%	98%
7.	Caesarean section	3%	5%
8.	Comprehensive emergency obstetric care	3%	2%
9.	Child immunization services	95%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	8%	14%
12.	HCT services	72%	62%
13.	HIV care and support services	28%	33%
14.	ARV prescription or ARV treatment follow-up services	35%	40%
15.	Services for PMTCT	63%	61%
16.	Diagnosis/treat child malnutrition	90%	88%
17.	Blood transfusion services	5%	4%
18.	Basic surgical services	35%	59%
19.	Staff providing FP services trained in adolescent sexual and reproductive health	85%	77%
Total number of facilities		60	1284

⁶ Mean availability of iron supplementation, folic acid supplementation, IPTP, TT vaccination and monitoring for hypertensive disorder of pregnancy.

Service readiness score		Bonthe	National
1	FP service	78%	76%
2	ANC service	64%	66%
3	Comprehensive obstetric care service	63%	44%
4	At least one staff trained in essential childbirth care	80%	85%
5	Staff trained in newborn resuscitation	86%	88%
6	Child immunization services	72%	68%
7	Child health preventive and curative care services	75%	74%
8	Malaria service	82%	81%
9	Tuberculosis service	65%	63%
10	HCT service	78%	82%
11	HIV/AIDS care and support service	63%	63%
12	HIV/AIDS ARV service	31%	31%
13	HIV/AIDS: PMTCT service	51%	53%

Kailahun District

Mean availability of services		Kailahun	National
1.	Diagnostic capacity	25%	33%
2.	FP services	96%	96%
3.	ANC services	96%	97%
4.	Obstetric signal functions ⁷	69%	76%
5.	Newborn signal functions	57%	60%
6.	Preventive and curative care for under-five children	96%	98%
7.	Caesarean section	3%	5%
8.	Comprehensive emergency obstetric care	3%	2%
9.	Child immunization services	96%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	17%	14%
12.	HCT services	61%	62%
13.	HIV care and support services	14%	33%
14.	ARV prescription or ARV treatment follow-up services	17%	40%
15.	Services for PMTCT	58%	61%
16.	Diagnosis/treat child malnutrition	76%	88%
17.	Blood transfusion services	6%	4%
18.	Basic surgical services	27%	59%
19.	Staff providing FP services trained in adolescent sexual and	82%	77%
Total number of facilities		71	1284

⁷ Mean availability of parenteral administration of antibiotics, parenteral administration of oxytocic drugs, parenteral administration of anticonvulsant, assisted vaginal delivery, manual removal of placenta and manual removal of retained products.

Service readiness score		Kailahun	National
1	FP service	74%	76%
2	ANC service	68%	66%
3	Comprehensive obstetric care service	58%	44%
4	At least one staff trained in essential childbirth care	85%	85%
5	Staff trained in newborn resuscitation	94%	88%
6	Child immunization services	80%	68%
7	Child health preventive and curative care services	71%	74%
8	Malaria service	86%	81%
9	Tuberculosis service	60%	63%
10	HCT service	78%	82%
11	HIV/AIDS care and support services	61%	63%
12	HIV/AIDS ARV service	25%	31%
13	HIV/AIDS: PMTCT service	40%	53%

Kambia District

Mean availability of services		Kambia	National
1.	Diagnostic capacity	31%	33%
2.	FP services	99%	96%
3.	ANC services	97%	97%
4.	Obstetric signal functions	77%	76%
5.	Newborn signal functions ⁸	57%	60%
6.	Preventive and curative care for under-five children	99%	98%
7.	Caesarean section	1%	5%
8.	Comprehensive emergency obstetric care	1%	2%
9.	Child immunization services	97%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	17%	14%
12.	HCT services	56%	62%
13.	HIV care and support services	18%	33%
14.	ARV prescription or ARV treatment follow-up services	30%	40%
15.	Services for PMTCT	55%	61%
16.	Diagnosis/treat child malnutrition	93%	88%
17.	Blood transfusion services	3%	4%
18.	Basic surgical services	66%	59%
19.	Staff providing FP services trained in adolescent sexual and	84%	77%
	Total number of facilities	71	1284

⁸ Mean availability of antibiotics for preterm or prolonged PROM, neonatal resuscitation, corticosteroids in preterm labour, KMC for premature/very small babies, and injectable antibiotics for neonatal sepsis.

Service readiness score		Kambia	National
1	FP service	79%	76%
2	ANC service	71%	66%
3	Comprehensive obstetric care service	65%	44%
4	At least one staff trained in essential childbirth care	96%	85%
5	Staff trained in newborn resuscitation	100%	88%
6	Child immunization services	73%	68%
7	Child health preventive and curative care services	83%	74%
8	Malaria service	88%	81%
9	Tuberculosis service	72%	63%
10	HCT service	89%	82%
11	HIV/AIDS care and support services	81%	63%
12	HIV/AIDS ARV service	32%	31%
13	HIV/AIDS: PMTCT service	56%	53%

Kenema District

Mean availability of services		Kenema	National
1.	Diagnostic capacity	38%	33%
2.	FP services	97%	96%
3.	ANC services	99%	97%
4.	Obstetric signal functions	85%	76%
5.	Newborn signal functions	70%	60%
6.	Preventive and curative care for under-five children ⁹	99%	98%
7.	Caesarean section	2%	5%
8.	Comprehensive emergency obstetric care	2%	2%
9.	Child immunization services	98%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	13%	14%
12.	HCT services	74%	62%
13.	HIV care and support services	39%	33%
14.	ARV prescription or ARV treatment follow-up services	53%	40%
15.	Services for PMTCT	73%	61%
16.	Diagnosis/treat child malnutrition	98%	88%
17.	Blood transfusion services	2%	4%
18.	Basic surgical services	67%	59%
19.	Staff providing FP services trained in adolescent sexual and	75%	77%
Total number of facilities		126	1284

⁹Mean availability of diagnosis/treat malnutrition, vitamin A supplementation, iron supplementation, ORS and zinc supplementation to children with diarrhoea, child growth monitoring, treatment of pneumonia, administration of amoxicillin for the treatment of pneumonia in children, and treatment of malaria in children.

Service readiness score		Kenema	National
1	FP service	84%	76%
2	ANC service	74%	66%
3	Comprehensive obstetric care service	58%	44%
4	At least one staff trained in essential childbirth care	89%	85%
5	Staff trained in newborn resuscitation	92%	88%
6	Child immunization services	59%	68%
7	Child health preventive and curative care services	83%	74%
8	Malaria service	90%	81%
9	Tuberculosis service	66%	63%
10	HCT service	87%	82%
11	HIV/AIDS care and support service	74%	63%
12	HIV/AIDS ARV service	34%	31%
13	HIV/AIDS: PMTCT service	58%	53%

Koinadugu District

Mean availability of services		Koinadugu	National
1.	Diagnostic capacity	35%	33%
2.	FP services	99%	96%
3.	ANC services	97%	97%
4.	Obstetric signal functions	84%	76%
5.	Newborn signal functions	59%	60%
6.	Preventive and curative care for under-five children	100%	98%
7.	Caesarean section	1%	5%
8.	Comprehensive emergency obstetric care ¹⁰	1%	2%
9.	Child immunization services ¹¹	95%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	15%	14%
12.	HCT services	53%	62%
13.	HIV care and support services	29%	33%
14.	ARV prescription or ARV treatment follow-up services	33%	40%
15.	Services for PMTCT	53%	61%
16.	Diagnosis/treat child malnutrition	82%	88%
17.	Blood transfusion services	1%	4%
18.	Basic surgical services	59%	59%
19.	Staff providing FP services trained in adolescent sexual and	73%	77%
Total number of facilities		126	1284

¹⁰ Mean availability of the seven obstetric signal functions, blood transfusion services and caesarean section.

¹¹ Mean availability of birth doses, infant vaccines, adolescent/adult vaccines and other services.

Service readiness score		Koinadugu	National
1	FP service	83%	76%
2	ANC service	66%	66%
3	Comprehensive obstetric care service	90%	44%
4	At least one staff trained in essential childbirth care	87%	85%
5	Staff trained in newborn resuscitation	95%	88%
6	Child immunization services	78%	68%
7	Child health preventive and curative care services	77%	74%
8	Malaria service	79%	81%
9	Tuberculosis service	66%	63%
10	HCT service	76%	82%
11	HIV/AIDS care and support services	63%	63%
12	HIV/AIDS ARV service	27%	31%
13	HIV/AIDS: PMTCT service	50%	53%

Kono District

Mean service readiness		Kono	National
1.	Diagnostic capacity	31%	33%
2.	FP services	93%	96%
3.	ANC services	97%	97%
4.	Obstetric signal functions	57%	76%
5.	Newborn signal functions	43%	60%
6.	Preventive and curative care for under-five children	97%	98%
7.	Caesarean section	2%	5%
8.	Comprehensive emergency obstetric care	1%	2%
9.	Child immunization services	96%	95%
10.	Diagnosis or treatment of malaria ¹²	99%	100%
11.	TB services	13%	14%
12.	HCT services	52%	62%
13.	HIV care and support services	27%	33%
14.	ARV prescription or ARV treatment follow-up services	30%	40%
15.	Services for PMTCT	59%	61%
16.	Diagnosis/treat child malnutrition	89%	88%
17.	Blood transfusion services	2%	4%
18.	Basic surgical services	28%	59%
19.	Staff providing FP services trained in adolescent sexual and	82%	77%
Total number of facilities		90	1284

¹² Mean availability of malaria diagnosis, malaria diagnosis testing, malaria diagnosis by clinical symptoms, malaria diagnosis by RDT, malaria diagnosis by microscopy, malaria treatment, and intermittent preventive therapy (IPT).

Service readiness score		Kono	National
1	FP service	75%	76%
2	ANC service	70%	66%
3	Comprehensive obstetric care service	90%	44%
4	At least one staff trained in essential childbirth care	91%	85%
5	Staff trained in newborn resuscitation	91%	88%
6	Child immunization services	71%	68%
7	Child health preventive and curative care services	77%	74%
8	Malaria service	83%	81%
9	Tuberculosis service	65%	63%
10	HCT service	85%	82%
11	HIV/AIDS care and support service	62%	63%
12	HIV/AIDS ARV service	35%	31%
13	HIV/AIDS: PMTCT service	57%	53%

Moyamba District

Mean availability of services		Moyamba	National
1.	Diagnostic capacity	26%	33%
2.	FP services	97%	96%
3.	ANC services	97%	97%
4.	Obstetric signal functions	77%	76%
5.	Newborn signal functions	62%	60%
6.	Preventive and curative care for under-five children	98%	98%
7.	Caesarean section	1%	5%
8.	Comprehensive emergency obstetric care	1%	2%
9.	Child immunization services	96%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services ¹³	13%	14%
12.	HCT services	41%	62%
13.	HIV care and support services	23%	33%
14.	ARV prescription or ARV treatment follow-up services	24%	40%
15.	Services for PMTCT	39%	61%
16.	Diagnosis/treat child malnutrition	94%	88%
17.	Blood transfusion services	2%	4%
18.	Basic surgical services	64%	59%
19.	Staff providing FP services trained in adolescent sexual and	69%	77%
	Total number of facilities	107	1284

¹³ Mean availability of TB diagnosis, TB diagnostic testing, TB diagnosis by clinical symptoms, TB diagnosis by sputum smear microscopy examination, TB diagnosis by culture, TB diagnosis by rapid test (GeneXpert MTB/RIF), TB diagnosis by chest X-ray, prescription of drugs to TB patients, provision of drugs to TB patients, and management and treatment follow-up for TB patients.

Service readiness score		Moyamba	National
1	FP service	70%	76%
2	ANC service	69%	66%
3	Comprehensive obstetric care service	80%	44%
4	At least one staff trained in essential childbirth care	86%	85%
5	Staff trained in newborn resuscitation	83%	88%
6	Child immunization services	70%	68%
7	Child health preventive and curative care services	73%	74%
8	Malaria service	86%	81%
9	Tuberculosis service	58%	63%
10	HCT service	86%	82%
11	HIV/AIDS care and support services	67%	63%
12	HIV/AIDS ARV service	30%	31%
13	HIV/AIDS: PMTCT service	55%	53%

Port Loko District

Mean availability of services		Port Loko	National
1.	Diagnostic capacity	33%	33%
2.	FP services	95%	96%
3.	ANC services	97%	97%
4.	Obstetric signal functions	84%	76%
5.	Newborn signal functions	60%	60%
6.	Preventive and curative care for under-five children	98%	98%
7.	Caesarean section	4%	5%
8.	Comprehensive emergency obstetric care	4%	2%
9.	Child immunization services	94%	95%
10.	Diagnosis or treatment of malaria	99%	100%
11.	TB services	15%	14%
12.	HCT services	55%	62%
13.	HIV care and support services	41%	33%
14.	ARV prescription or ARV treatment follow-up services	50%	40%
15.	Services for PMTCT	58%	61%
16.	Diagnosis/treat child malnutrition	96%	88%
17.	Blood transfusion services	4%	4%
18.	Basic surgical services	14%	59%
19.	Staff providing FP services trained in adolescent sexual and	74%	77%
Total number of facilities		114	1284

Service readiness score		Port Loko	National
1	FP service	81%	76%
2	ANC service	66%	66%

3	Comprehensive obstetric care service ¹⁴	58%	44%
4	At least one staff trained in essential childbirth care	91%	85%
5	Staff trained in newborn resuscitation	92%	88%
6	Child immunization services	70%	68%
7	Child health preventive and curative care services	64%	74%
8	Malaria service	79%	81%
9	Tuberculosis service	60%	63%
10	HCT service	89%	82%
11	HIV/AIDS care and support services	61%	63%
12	HIV/AIDS ARV service	34%	31%
13	HIV/AIDS: PMTCT service	59%	53%

Pujehun District

Mean availability of services		Pujehun	National
1.	Diagnostic capacity	34%	33%
2.	FP services	100%	96%
3.	ANC services	100%	97%
4.	Obstetric signal functions	76%	76%
5.	Newborn signal functions	73%	60%
6.	Preventive and curative care for under-five children	100%	98%
7.	Caesarean section	1%	5%
8.	Comprehensive emergency obstetric care	1%	2%
9.	Child immunization services	99%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	10%	14%
12.	HCT services ¹⁵	56%	62%
13.	HIV care and support services	41%	33%
14.	ARV prescription or ARV treatment follow-up services	51%	40%
15.	Services for PMTCT	56%	61%
16.	Diagnosis/treat child malnutrition	94%	88%
17.	Blood transfusion services	1%	4%
18.	Basic surgical services	44%	59%
19.	Staff providing FP services trained in adolescent sexual and	94%	77%
Total number of facilities		79	1284

¹⁴ Readiness score for staff and guidelines, equipment, diagnostics, and medicines and commodities among facilities that provide caesarean section.

¹⁵ Mean availability of guidelines for HCT, at least one staff trained in HCT, room with visual and auditory privacy, HIV diagnostic capacity, and condoms.

Service readiness score		Pujehun	National
1	FP service	76%	76%
2	ANC service	69%	66%
3	Comprehensive obstetric care service	90%	44%
4	At least one staff trained in essential childbirth care	95%	85%
5	Staff trained in newborn resuscitation	96%	88%
6	Child immunization services	69%	68%
7	Child health preventive and curative care services	72%	74%
8	Malaria service	86%	81%
9	Tuberculosis service	63%	63%
10	HCT service	83%	82%
11	HIV/AIDS care and support services	60%	63%
12	HIV/AIDS ARV service	35%	31%
13	HIV/AIDS: PMTCT service	62%	53%

Tonkolili District

Mean availability of services		Tonkolili	National
1.	Diagnostic capacity	34%	33%
2.	FP services	98%	96%
3.	ANC services	98%	97%
4.	Obstetric signal functions	80%	76%
5.	Newborn signal functions	62%	60%
6.	Preventive and curative care for under-five children	99%	98%
7.	Caesarean section	3%	5%
8.	Comprehensive emergency obstetric care	3%	2%
9.	Child immunization services	94%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	16%	14%
12.	HCT services	64%	62%
13.	HIV care and support services ¹⁶	21%	33%
14.	ARV prescription or ARV treatment follow-up services	26%	40%
15.	Services for PMTCT	56%	61%
16.	Diagnosis/treat child malnutrition	79%	88%
17.	Blood transfusion services	4%	4%
18.	Basic surgical services	70%	59%
19.	Staff providing FP services trained in adolescent sexual and	96%	77%
	Total number of facilities	107	1284

¹⁶ Treatment of opportunistic infections, provision of palliative care, IV treatment of fungal infections, treatment for Kaposi's sarcoma, nutritional rehabilitation services, provide/prescribe fortified protein supplementation, care for paediatric HIV/AIDS patients, provide/prescribe preventative treatment for TB, preventative treatment for opportunistic infections, and provide/prescribe micronutrient supplementation and others.

Service readiness score		Tonkolili	National
1	FP service	73%	76%
2	ANC service	60%	66%
3	Comprehensive obstetric care service	57%	44%
4	At least one staff trained in essential childbirth care	76%	85%
5	Staff trained in newborn resuscitation	86%	88%
6	Child immunization services	57%	68%
7	Child health preventive and curative care services	65%	74%
8	Malaria service	78%	81%
9	Tuberculosis service	48%	63%
10	HCT service	74%	82%
11	HIV/AIDS care and support services	58%	63%
12	HIV/AIDS ARV service	25%	31%
13	HIV/AIDS: PMTCT service	48%	53%

Western Rural District

Mean availability of services		Western Rural	National
1.	Diagnostic capacity	34%	33%
2.	FP services	100%	96%
3.	ANC services	100%	97%
4.	Obstetric signal functions	75%	76%
5.	Newborn signal functions	57%	60%
6.	Preventive and curative care for under-five children	96%	98%
7.	Caesarean section	2%	5%
8.	Comprehensive emergency obstetric care	2%	2%
9.	Child immunization services	96%	95%
10.	Diagnosis or treatment of malaria	100%	100%
11.	TB services	24%	14%
12.	HCT services	80%	62%
13.	HIV care and support services	36%	33%
14.	ARV prescription or ARV treatment follow-up services ¹⁷	56%	40%
15.	Services for PMTCT	80%	61%
16.	Diagnosis/treat child malnutrition	82%	88%
17.	Blood transfusion services	0%	4%
18.	Basic surgical services	27%	59%
19.	Staff providing FP services trained in adolescent sexual and	77%	77%
	Total number of facilities	55	1284

¹⁷ Mean availability of ART prescription; provision of treatment follow-up services for persons on ART.

Service readiness score		Western Rural	National
1	FP service	66%	76%
2	ANC service	57%	66%
3	Comprehensive obstetric care service	55%	44%
4	At least one staff trained in essential childbirth care	75%	85%
5	Staff trained in newborn resuscitation	81%	88%
6	Child immunization services	67%	68%
7	Child health preventive and curative care services	68%	74%
8	Malaria service	71%	81%
9	Tuberculosis service	56%	63%
10	HCT service	78%	82%
11	HIV/AIDS care and support services	56%	63%
12	HIV/AIDS ARV service	28%	31%
13	HIV/AIDS: PMTCT service	51%	53%

Western Urban District

Mean availability of services		Western Urban	National
1.	Diagnostic capacity	43%	33%
2.	FP services	91%	96%
3.	ANC services	91%	97%
4.	Obstetric signal functions	77%	76%
5.	Newborn signal functions	60%	60%
6.	Preventive and curative care for under-five children	91%	98%
7.	Caesarean section	13%	5%
8.	Comprehensive emergency obstetric care	9%	2%
9.	Child immunization services	91%	95%
10.	Diagnosis or treatment of malaria	99%	100%
11.	TB services	25%	14%
12.	HCT services	88%	62%
13.	HIV care and support services	56%	33%
14.	ARV prescription or ARV treatment follow-up services	65%	40%
15.	Services for PMTCT ¹⁸	84%	61%
16.	Diagnosis/treat child malnutrition	85%	88%
17.	Blood transfusion services	15%	4%
18.	Basic surgical services	40%	59%
19.	Staff providing FP services trained in adolescent sexual and	77%	77%
Total number of facilities		68	1284

¹⁸ HCT to HIV+ pregnant women, HCT to infants born to HIV+ pregnant women, ARV prophylaxis to HIV+ women, ARV prophylaxis to newborns born to HIV+ pregnant women, infant & young child feeding counselling, nutritional counselling for HIV+ women & their infants, and FP counselling to HIV+ women.

Service readiness score		Western Urban	National
1	FP service	69%	76%
2	ANC service	63%	66%
3	Comprehensive obstetric care service	62%	44%
4	At least one staff trained in essential childbirth care	85%	85%
5	Staff trained in newborn resuscitation	85%	88%
6	Child immunization services	70%	68%
7	Child health preventive and curative care services	68%	74%
8	Malaria service	72%	81%
9	Tuberculosis service	67%	63%
10	HCT service	84%	82%
11	HIV/AIDS care and support services	60%	63%
12	HIV/AIDS ARV service	37%	31%
13	HIV/AIDS: PMTCT service	54%	53%

Chapter Five: Recommendations

Infrastructure

The country has a reasonable health facility density across all districts. The recommendations for consideration are:

- Invest in equipping health facilities with the basic equipment necessary for QoC.
- Increase the bed capacity for inpatient services.
- Improve the transport capacity for emergency services.
- Make deliberate investments to increase the laboratory diagnostic capacity of all health facilities. The PHUs should also be equipped to carry out basic laboratory tests.
- Invest in amenities to improve sanitation, the availability of electricity, internet connectivity, and infection prevention and control.

Human resources

The SARA+ findings show an absolute shortage of health workers and limitations in the skill mix required to improve service delivery and QoC. The following are recommendations for consideration:

- Increase the number of health care workers across the board. An initial step should be to establish a policy allowing for the absorption of health care workers currently offering services by part-time engagement or as volunteers.
- Focus deliberately on the training of specialist doctors, nurses and other cadres.
- Adopt a policy allowing for the attraction and retention of health care workers in remote and rural parts of the country.

Service delivery

- Target investments to increase the availability of surgical methods of FP and FP services for adolescents.
- Make ANC services available at all health facilities, except specialized hospitals. Consider instituting incentives to increase ANC services at all PHUs and private facilities.
- Make deliberate investments to ensure that all PHUs are BEmONC-ready. Focus on improving the neonatal signal functions by training and making teaching aids, equipment, medicines and staff available.
- Improve the availability of immunization services by increasing the number of immunizing sites, increasing outreach services, addressing the stockouts of vaccines, investing more in cold chain equipment, and training personnel on effective cold chain maintenance and temperature monitoring.
- Increase the availability of HIV testing, ART services and PMTCT services.

Quality of care

HIV counselling and testing: Improving their quality requires consistent reminding of service providers about the service components that they are expected to provide, and monitoring (for example, through supervision) that service provision is consistently documented. Based on the results of the record review and the related information in the SARA, steps to improve the quality of HCT services are:

- Develop a functional system to receive follow-up information about patients referred for care and support services, especially when the services require referral to another facility. This is important for improving the outcome for HIV-infected persons and for preventing transmission.
- Ensure that guidelines are available at the service sites to reinforce the service components that should be delivered.
- Distribution of condoms should be a routine service; the documentation that patients took condoms provides information that is important for monitoring service provision.

Malaria services: Based on the results of the record review and the related information in the SARA, steps to improve the quality of malaria services are:

- Address drug and other commodity stockouts and improve the routine availability of ACTs and rapid malaria tests at the facility level, and particularly the logistics issues that are apparent in the Western and Northern regions.
- Reinforce the protocols for managing suspect malaria. This can be accomplished through supervision, job aids, and periodic in-service reinforcement. In the Northern and Eastern regions, in particular, either the ART dose was wrong, or the dose was not recorded across facilities (in 37% and 23% of the records, respectively). This makes checking on service quality and follow-up difficult, should the patient return with recurrent or continuing symptoms.
- It is not clear what the problem was when the ACT dose was incorrect because ACT comes in pre-packaged blister packages. Discussion with data collectors should help to clarify the issue.
- Conduct a review of the other antimalarial drugs that are being prescribed, along with ACT, to understand the rationale, and plan a strategy to stop this practice, unless there are specific criteria (if they exist) met.

Antenatal and newborn care: The results of the QoC assessment led to the following recommendations for consideration:

- Provide a refresher memo or in-service training, or a job aid (for example, a poster) that will visually remind service providers of the key services to be delivered and of the importance of documenting them for continuity of care. These actions may improve adherence to standards.

- Focus supervisory visits for ANC on the package of services and on addressing barriers to providing them. Supervisory visits should first address the issue of why services are not being provided/documentated in the facilities that have resources.
- There are low-cost tests for anaemia and syphilis. If the funding system is a barrier (for example, if the facility must allocate funds to purchase them) or if policy is a barrier (for example, laboratory tests are not expected at a certain level of facility), these issues should be addressed so that critical screening services can be provided at all facilities providing ANC services. Providing hand-held machines to test for anaemia is a relatively low-cost and critical improvement for service availability, and probably for utilization. Similarly, the rapid test for syphilis should be made available at service sites. In addition to increasing screening for syphilis, ensuring the availability of drugs for treatment and service provider training to provide treatment are critical.
- Facilities and regional supervisors should develop strategies to improve the use of ANC services and, if this is the issue, improve their use earlier in pregnancy. School education programmes, women's groups, and even posters to advocate on the benefits to the mother and baby can play a part in raising awareness among women and men in the community.

Delivery services: The following recommendations should be considered to improve delivery services.

- Supervisors should consistently check that the routine monitoring tools are available and used. The Apgar score may depend on improving physician practices in some facilities.
- Policies should be developed, if needed, and enforced to ensure that oxytocin is kept in the delivery service area. If an emergency delivery arrives after normal work hours, access to oxytocin from a pharmacy may be limited.
- The policy on the newborn dose of BCG and care of preterm labour should be clarified and reinforced.

TB services: Based on the results of the record review and the related information in the SARA, recommendations to improve the quality of TB services are:

- Assess the reason for the weak diagnostic practices in the Western and Northern regions. Where feasible, expand the laboratory diagnostic capacity. Where not feasible, the focus should be on the system for sending sputum elsewhere for testing and receiving results.
- Improve adherence to standards for HIV testing of TB patients; CPT should be a focus.
- There is no legitimate rationale for not having HIV test results for every TB patient, especially because almost all facilities had the HIV test available.
- Reinforce that the results from clinical assessments of TB patients should be recorded. A template for the items to be recorded (for example, weight, other vital signs) will improve the consistency of reporting.
- Reminders about the standard practices that are expected are needed because the lack of adherence and of documentation do not seem to be highly associated with the lack of ability to provide these services. Job aids that remind service providers of what is

expected and that share with patients what they should expect during their treatment may be useful (for example, a poster outlining when sputum tests will be conducted, that an HIV test will be advised). Job aids can reinforce the expectations for the services to be provided.

- Supervisors should focus on issues identified as weak by the record review rather than trying to address all items at once. It seems that diagnostic criteria and HIV testing are two critical areas where the percentage of patients receiving these services should be increased.
- There appears to be a need to reinforce the expectations for contact tracing, and to develop a functional system that supports it. The results show that this has not been an area of attention by supervisors or the system. Along with contact listing, a system is needed to ensure that follow up is possible. Whether contact tracing can be conducted by phone, whether the patient can encourage contacts to come for testing (unlikely, because this can be a sensitive issue), whether linkages with community workers can be drawn on to help with contact tracing, or whether there will be a need for transportation resources to go to households, need to be assessed.

Annex I

Table 21: Summary of general service readiness, by district

Districts	Basic amenities mean score	Basic equipment mean score	Standard precautions mean score	Diagnostics mean score	Essential medicines mean score	General service readiness index	Total number of facilities
Bo	56%	79%	84%	29%	33%	56%	138
Bombali	58%	73%	79%	36%	37%	57%	120
Bonthe	47%	70%	81%	31%	34%	53%	60
Kailahun	55%	81%	77%	25%	27%	53%	71
Kambia	58%	74%	86%	31%	36%	57%	71
Kenema	58%	86%	86%	38%	35%	61%	126
Koinadugu	48%	71%	85%	35%	37%	55%	78
Kono	55%	80%	78%	31%	33%	55%	90
Moyamba	53%	76%	87%	26%	31%	55%	107
Port Loko	66%	77%	85%	33%	25%	57%	114
Pujehun	62%	82%	87%	34%	28%	58%	79
Tonkolili	55%	77%	83%	34%	24%	55%	107
Western Rural	62%	74%	78%	34%	25%	54%	55
Western Urban	64%	75%	83%	43%	30%	59%	68
Facility type							
Hospital	83%	90%	92%	82%	62%	82%	56
CHC	65%	83%	85%	45%	36%	63%	224
CHP	56%	76%	81%	29%	29%	54%	328
MCHP	53%	75%	83%	25%	28%	53%	629
Clinic	60%	70%	84%	43%	33%	58%	47

Managing authority							
Government/ Public	56%	77%	83%	31%	30%	55%	1202
Private	76%	82%	87%	62%	46%	71%	82
Urban/ Rural							
Urban	65%	80%	87%	47%	35%	63%	200
Rural	56%	77%	82%	30%	31%	55%	1084
Total	57%	77%	83%	33%	31%	56%	1284

Table 22: Summary of general readiness indices, by facility type and managing authority

	Basic	Basic	Standard	Diagnostics	Essential	General	Total
Facility type							
Hospital	83%	90%	92%	82%	62%	82%	56
CHC	65%	83%	85%	45%	36%	63%	224
CHP	56%	76%	81%	29%	29%	54%	328
MCHP	53%	75%	83%	25%	28%	53%	629
Clinic	60%	70%	84%	43%	33%	58%	47
Managing authority							
Government/Public	56%	77%	83%	31%	30%	55%	1202
Private	76%	82%	87%	62%	46%	71%	82
Urban/Rural							
Urban	65%	80%	87%	47%	35%	63%	200
Rural	56%	77%	82%	30%	31%	55%	1084
Total	57%	77%	83%	33%	31%	56%	1284

Table 23: National summary of FP commodity availability and stockouts

	Combined estrogen progestrone injectable contraceptives	Progestin-only injectable contraceptives	Female condoms	Implants	Emergency contraceptive	Intrauterine contraceptive device (IUCD)	Female condom stockouts	Implants stockouts	Emergency contraceptive stockouts	Total number of facilities
Facility type										
Hospital	70%	61%	67%	82%	82%	73%	42%	24%	42%	33
CHC	59%	46%	71%	86%	76%	56%	34%	25%	38%	224
CHP	46%	41%	56%	51%	62%	13%	40%	29%	41%	325
MCHP	61%	40%	63%	40%	74%	8%	31%	20%	30%	624
Clinic	63%	41%	52%	59%	70%	22%	48%	26%	48%	27
Managing authority										
Government/ Public	57%	42%	63%	53%	72%	19%	35%	24%	35%	1190
Private	56%	40%	42%	60%	51%	37%	30%	12%	42%	43
Urban/Rural										
Urban	56%	49%	52%	64%	71%	35%	48%	20%	40%	172
Rural	57%	40%	64%	51%	71%	18%	32%	24%	34%	1061
Total	57%	42%	62%	53%	71%	20%	34%	24%	35%	1233 ¹⁹

¹⁹ Specialized hospitals do not offer FP services.

Table 24: National summary of vaccines stockouts

	Measles vaccine stock-outs	DPT-HiB+HepB vaccine stockouts	Oral polio vaccine stockouts	BCG vaccine stock-outs	Rotavirus vaccine stockouts	Pneumococcal vaccine stockouts	IPV vaccine stock-outs	HPV vaccine stock-outs	Total number of facilities
Districts									
Bo	8%	1%	2%	10%	4%	2%	0%	0%	132
Bombali	8%	6%	8%	13%	8%	6%	0%	0%	109
Bonthe	5%	5%	5%	2%	2%	5%	0%	0%	57
Kailahun	12%	10%	10%	13%	13%	10%	0%	0%	68
Kambia	10%	4%	4%	7%	4%	4%	0%	0%	69
Kenema	8%	4%	4%	6%	11%	3%	0%	0%	123
Koinadugu	9%	1%	4%	8%	4%	3%	0%	0%	74
Kono	5%	1%	0%	6%	3%	0%	0%	0%	86
Moyamba	2%	0%	1%	5%	3%	0%	0%	0%	103
Port Loko	7%	3%	3%	4%	4%	3%	0%	0%	107
Pujehun	3%	5%	3%	5%	6%	1%	0%	0%	78
Tonkolili	10%	7%	6%	15%	17%	8%	0%	0%	101
Western Rural	9%	8%	4%	6%	4%	4%	0%	0%	53
Western Urban	11%	2%	2%	3%	8%	2%	0%	0%	62
Facility type									
Hospital	4%	7%	4%	0%	4%	0%	0%	0%	27
CHC	9%	4%	2%	6%	4%	3%	0%	0%	224
CHP	8%	5%	4%	8%	7%	4%	0%	0%	319
MCHP	7%	3%	4%	8%	8%	4%	0%	0%	621
Clinic	3%	3%	6%	6%	3%	3%	0%	0%	31

Managing authority									
Government/Public	8%	4%	4%	8%	7%	4%	0%	0%	1178
Private	7%	2%	2%	0%	2%	0%	0%	0%	44
Urban/Rural									
Urban	11%	3%	3%	6%	7%	2%	0%	0%	171
Rural	7%	4%	4%	8%	7%	4%	0%	0%	1051
Total	8%	4%	4%	8%	7%	4%	0%	0%	1222 ²⁰

²⁰ The number of facilities offering immunization services.

Table 25: Summary of cold chain minimum requirements

	Cold chain minimum requirements	Energy source and power supply for vaccine refrigerator	Power used for cold chain refrigeration-grid or generator	Power used for cold chain refrigeration-solar	Power used for cold chain refrigeration-gas	Power used for cold chain refrigeration-kerosene	Power used for cold chain refrigeration-mixed	Power used for cold chain refrigeration-other	Total number of facilities
Districts									
Bo	27%	52%	11%	56%	0%	0%	0%	0%	132
Bombali	17%	60%	1%	74%	0%	0%	0%	0%	109
Bonthe	40%	75%	2%	82%	0%	0%	0%	0%	57
Kailahun	59%	79%	4%	88%	1%	0%	0%	0%	68
Kambia	46%	75%	0%	81%	0%	0%	0%	0%	69
Kenema	18%	38%	3%	39%	0%	0%	0%	0%	123
Koinadugu	58%	80%	0%	84%	0%	0%	0%	0%	74
Kono	24%	65%	1%	90%	0%	0%	0%	0%	86
Moyamba	23%	78%	0%	81%	0%	0%	0%	0%	103
Port Loko	22%	66%	2%	83%	0%	0%	0%	0%	107
Pujehun	31%	53%	5%	64%	0%	0%	0%	0%	78
Tonkolili	7%	56%	0%	60%	0%	0%	0%	0%	101
Western Rural	23%	64%	6%	68%	0%	0%	0%	0%	53
Western Urban	29%	48%	26%	34%	0%	0%	0%	0%	62
Facility type									
Hospital	37%	78%	48%	41%	0%	0%	0%	0%	27
CHC	50%	83%	5%	89%	0%	0%	0%	0%	224
CHP	28%	66%	4%	76%	0%	0%	0%	0%	319

MCHP	20%	52%	1%	61%	0%	0%	0%	0%	621
Clinic	23%	48%	10%	45%	0%	0%	0%	0%	31
Managing authority									
Government/ Public	28%	62%	3%	70%	0%	0%	0%	0%	1178
Private	25%	52%	18%	41%	0%	0%	0%	0%	44
Urban/Rural									
Urban	25%	40%	22%	35%	0%	0%	0%	0%	171
Rural	29%	65%	1%	75%	0%	0%	0%	0%	1051
Total	28%	62%	4%	69%	0%	0%	0%	0%	1222 ²¹

²¹ The number of facilities providing immunization services.

Table 26: Summary of availability of lifesaving medicines

	Female condoms	Implants	Emergency contraceptives	Oxytocin	Misoprostol	Magnesium sulphate	Injectable anti-bi-otics	Antenatal corticosteroids	Skin disinfectant	Resuscitation equipment	Amoxicillin	Oral rehydration salts	Zinc sulphate	Total number of facilities
Districts														
Bo	64%	34%	60%	78%	4%	91%	28%	42%	95%	41%	93%	99%	91%	138
Bombali	33%	38%	34%	84%	8%	66%	19%	25%	99%	44%	95%	98%	90%	120
Bonthe	22%	50%	87%	93%	25%	98%	10%	78%	92%	12%	93%	97%	62%	60
Kailahun	55%	58%	52%	73%	7%	94%	18%	17%	79%	32%	65%	70%	96%	71
Kambia	27%	82%	86%	92%	18%	94%	27%	63%	87%	24%	97%	99%	99%	71
Kenema	56%	63%	85%	90%	8%	88%	36%	40%	98%	52%	94%	97%	79%	126
Koinadugu	83%	74%	95%	90%	13%	90%	51%	71%	97%	56%	92%	91%	91%	78
Kono	79%	48%	77%	87%	37%	92%	12%	61%	90%	58%	90%	89%	86%	90
Moyamba	81%	38%	61%	94%	10%	90%	22%	80%	99%	34%	69%	80%	96%	107
Port Loko	86%	53%	69%	86%	6%	96%	15%	44%	86%	41%	16%	87%	93%	114
Pujehun	53%	51%	80%	86%	0%	91%	8%	81%	86%	56%	54%	75%	86%	79
Tonkolili	84%	53%	82%	93%	5%	89%	11%	67%	93%	61%	43%	24%	93%	107
Western	44%	38%	49%	65%	15%	75%	20%	42%	82%	40%	44%	75%	76%	55
Western	40%	51%	53%	62%	22%	72%	34%	43%	82%	37%	53%	76%	74%	68
Facility														
Hospital	46%	50%	50%	71%	41%	73%	86%	88%	100%	64%	89%	93%	77%	56
CHC	71%	86%	76%	90%	29%	94%	51%	55%	93%	56%	77%	89%	88%	224
CHP	55%	51%	61%	84%	5%	85%	12%	37%	89%	42%	71%	84%	90%	328

MCHP	62%	40%	74%	86%	5%	91%	11%	57%	92%	39%	70%	80%	89%	629
Clinic	30%	34%	40%	57%	17%	47%	32%	53%	83%	23%	72%	77%	62%	47
Managing														
Government	63%	52%	72%	86%	10%	90%	20%	52%	92%	43%	72%	83%	89%	1202
Private	24%	32%	27%	60%	26%	55%	60%	70%	85%	41%	76%	82%	66%	82
Urban/														
Urban	46%	55%	61%	68%	21%	75%	37%	50%	89%	43%	76%	85%	76%	200
Rural	63%	50%	70%	88%	10%	90%	20%	53%	92%	43%	71%	83%	90%	1084
Total	60%	51%	69%	85%	11%	88%	23%	53%	92%	43%	72%	83%	88%	1284

Table 27: Summary of HIV and AIDS availability of support and care services

	Offers HIV care and support services	Treatment of opportunistic infections	Provision of palliative care	IV treatment of fungal infections	Treatment for Kaposi's sarcoma	Nutritional rehabilitation services	Provide/prescribe fortified protein supplementation	Care for paediatric HIV/AIDS patients	Provide/prescribe preventative treatment for TB	Preventative treatment for opportunistic infections	Provide/prescribe micronutrient supplementation	FP counselling	Provide condoms	Total number of facilities
Districts														
Bo	44%	41%	39%	22%	9%	29%	20%	32%	11%	41%	43%	43%	43%	138
Bombali	38%	36%	19%	14%	11%	30%	22%	23%	9%	32%	37%	38%	37%	120
Bonthe	28%	28%	23%	17%	12%	23%	15%	12%	8%	20%	23%	25%	27%	60
Kailahun	14%	14%	11%	7%	3%	14%	13%	13%	8%	8%	10%	14%	14%	71
Kambia	18%	18%	14%	11%	10%	15%	17%	15%	15%	18%	18%	18%	18%	71
Kenema	39%	32%	29%	16%	9%	33%	28%	36%	15%	33%	37%	39%	38%	126
Koinadugu	29%	27%	22%	13%	8%	21%	10%	21%	14%	26%	27%	29%	29%	78

Kono	27%	22%	14%	9%	6%	16%	12%	16%	11%	22%	21%	24%	26%	90
Moyamba	23%	23%	23%	15%	7%	19%	16%	21%	10%	22%	23%	23%	23%	107
Port Loko	41%	39%	29%	13%	7%	34%	33%	33%	16%	35%	39%	41%	40%	114
Pujehun	41%	35%	34%	28%	27%	38%	35%	38%	11%	32%	38%	41%	41%	79
Tonkolili	21%	20%	14%	9%	7%	16%	8%	15%	10%	21%	21%	21%	21%	107
Western Rural	36%	35%	27%	16%	15%	29%	25%	33%	18%	33%	33%	36%	36%	55
Western Urban	56%	53%	47%	37%	26%	44%	37%	40%	22%	49%	51%	51%	53%	68
Facility type														
Hospital	70%	68%	66%	54%	54%	55%	46%	52%	57%	70%	66%	66%	64%	56
CHC	71%	68%	55%	41%	30%	59%	49%	58%	46%	67%	68%	71%	71%	224
CHP	30%	27%	23%	11%	5%	23%	17%	21%	5%	24%	27%	29%	30%	328
MCHP	19%	17%	13%	7%	3%	14%	11%	14%	2%	15%	18%	19%	19%	629
Clinic	19%	19%	9%	4%	4%	19%	13%	17%	2%	15%	19%	17%	15%	47
Managing														
Government/	33%	30%	25%	15%	10%	26%	21%	25%	12%	28%	31%	33%	33%	1202
Private	35%	35%	29%	23%	17%	26%	24%	32%	18%	34%	33%	33%	30%	82
Urban/Rural														
Urban	56%	52%	45%	30%	25%	43%	32%	43%	24%	50%	53%	54%	54%	200
Rural	29%	27%	21%	13%	8%	23%	19%	22%	11%	25%	27%	29%	29%	1084
Total	33%	31%	25%	16%	11%	26%	21%	25%	13%	29%	31%	33%	33%	1284

Table 28: Readiness for provision of ART services

	Guidelines available ART	At least 1 trained staff ART prescription and management	Complete blood count (CBC)	CD4 or viral load	Renal function test	Liver function test	3 first- line ARVs	Percentage of facilities with all items	Mean availability of tracer items	Total number of facilities
Districts										
Bo	47%	86%	2%	2%	2%	2%	76%	0%	31%	59
Bombali	42%	75%	4%	2%	5%	5%	58%	2%	27%	55
Bonthe	76%	90%	0%	5%	5%	5%	33%	0%	31%	21
Kailahun	58%	83%	0%	0%	0%	0%	33%	0%	25%	12
Kambia	76%	86%	0%	0%	0%	0%	62%	0%	32%	21
Kenema	78%	81%	1%	1%	3%	3%	72%	0%	34%	67
Koinadugu	62%	69%	0%	0%	4%	4%	54%	0%	27%	26
Kono	63%	93%	0%	4%	4%	4%	81%	0%	35%	27
Moyamba	73%	88%	0%	0%	0%	0%	50%	0%	30%	26
Port Loko	61%	93%	0%	2%	0%	2%	77%	0%	34%	57
Pujehun	65%	98%	3%	3%	3%	3%	75%	3%	35%	40
Tonkolili	25%	86%	4%	7%	7%	7%	39%	0%	25%	28
Western Rural	55%	77%	0%	3%	0%	3%	55%	0%	28%	31
Western Urban	66%	86%	11%	11%	14%	14%	55%	2%	37%	44
Facility type										
Hospital	74%	95%	19%	26%	36%	36%	81%	5%	52%	42
CHC	70%	92%	1%	2%	1%	2%	73%	1%	34%	181
CHP	53%	76%	1%	1%	1%	1%	51%	0%	26%	118
MCHP	51%	81%	0%	0%	0%	1%	56%	0%	27%	163

Clinic	50%	90%	0%	0%	0%	0%	60%	0%	29%	10
Managing authority										
Government/Public	60%	84%	1%	2%	2%	2%	62%	0%	30%	482
Private	63%	94%	16%	19%	28%	34%	75%	3%	47%	32
Urban/Rural										
Urban	63%	87%	5%	6%	9%	9%	65%	2%	35%	128
Rural	59%	84%	1%	2%	2%	2%	62%	0%	30%	386
Total	60%	85%	2%	3%	4%	4%	63%	1%	31%	514

Table 29: Readiness for provision of basic surgical services

	Guidelines available IMESC*	At least 1 trained staff IMESC*	Needle holder	Scalpel handle with blade	Retractor	Surgical scissors	Nasogastric tubes	Tourniquet	Adult and paediatric resuscitators	Suction apparatus	Oxygen	Skin disinfectant	Sutures	Ketamine (injectable)	Lidocaine (1% or 2% injectable)	Splints for extremities	Material for cast	Percentage of facilities with all items	Mean availability of tracer items	Total number of facilities
Districts																				
Bo	18%	17%	66%	49	12%	78%	46%	54%	47%	46%	11%	97%	72%	12%	99%	7%	7%	0%	43%	76
Bombali	6%	9%	53%	23	8%	65%	34%	69%	74%	36%	3%	100%	55%	9%	76%	1%	5%	0%	37%	80
Bonthe	13%	17%	30%	20	13%	60%	37%	20%	57%	20%	7%	93%	30%	10%	100%	10%	3%	0%	31%	30
Kailahun	19%	11%	56%	33	7%	52%	59%	93%	26%	52%	7%	89%	78%	11%	96%	7%	4%	0%	41%	27
Kambia	12%	15%	62%	37	17%	37%	27%	27%	70%	40%	2%	88%	73%	15%	82%	0%	0%	0%	36%	60
Kenema	26%	13%	89%	41	14%	82%	56%	71%	71%	56%	3%	98%	83%	5%	93%	3%	4%	0%	48%	98
Koinadugu	17%	10%	79%	31	8%	65%	21%	40%	73%	19%	6%	100%	65%	13%	92%	2%	6%	0%	38%	48
Kono	13%	7%	71%	49	7%	82%	36%	78%	69%	38%	2%	98%	73%	7%	98%	4%	0%	0%	43%	45

Moyamba	18%	19%	68%	30	8%	81%	26%	48%	53%	34%	3%	100%	89%	10%	89%	1%	8%	0%	41%	73
Port Loko	26%	21%	59%	44	26%	59%	29%	38%	56%	32%	9%	88%	82%	15%	91%	3%	12%	3%	41%	34
Pujehun	13%	8%	79%	58	3%	84%	45%	0%	74%	21%	3%	82%	66%	3%	97%	3%	5%	0%	38%	38
Tonkolili	10%	11%	52%	14	9%	74%	32%	84%	77%	38%	2%	93%	44%	6%	77%	2%	7%	0%	37%	81
Western Rural	14%	18%	89%	50	18%	71%	29%	50%	64%	50%	7%	89%	43%	18%	86%	0%	7%	0%	42%	28
Western Urban	21%	19%	86%	57	24%	79%	48%	62%	64%	50%	19%	95%	74%	19%	95%	12%	14%	0%	50%	42
Facility type																				
Hospital	40%	40%	98%	92	80%	94%	84%	78%	80%	82%	64%	100%	98%	74%	100%	44%	48%	0%	76%	50
CHC	19%	17%	81%	59	16%	85%	53%	58%	80%	44%	3%	94%	69%	7%	95%	1%	6%	0%	47%	178
CHP	13%	8%	58%	26	5%	67%	36%	57%	61%	35%	0%	94%	63%	4%	89%	1%	1%	0%	37%	185
MCHP	12%	11%	60%	20	3%	61%	24%	50%	57%	34%	0%	95%	64%	5%	85%	0%	2%	0%	34%	325
Clinic	18%	18%	77%	50	14%	82%	23%	68%	45%	27%	5%	100%	82%	9%	91%	5%	9%	0%	44%	22
Managing																				
Government/Publi	15%	13%	65%	33	9%	69%	36%	54%	64%	37%	3%	95%	66%	8%	89%	2%	4%	0%	39%	703
Private	32%	26%	98%	82	46%	93%	58%	81%	65%	67%	33%	96%	93%	39%	95%	28%	28%	2%	63%	57
Urban/Rural																				
Urban	20%	19%	80%	62	28%	85%	55%	65%	65%	55%	18%	98%	76%	24%	94%	13%	12%	0%	51%	127
Rural	15%	13%	65%	31	9%	68%	34%	54%	64%	36%	3%	94%	66%	7%	88%	2%	5%	0%	39%	633
Total	16%	14%	68%	36	12%	71%	38%	56%	64%	39%	5%	95%	68%	10%	89%	4%	6%	0%	41%	760

* Integrated Management for Emergency and Essential Surgical Care

Table 30: Availability of medicines for infectious diseases

	Me- /albendazole cap/tab	Amoxicillin cap/tab	Ceftriaxone injection	Co- trimoxazole cap/tab	Ciprofloxacin cap/tab	Fluconazole cap/tab	Metronidazole cap/tab	Total number of facilities
Districts								
Bo	99%	91%	31%	83%	20%	4%	98%	138
Bombali	97%	93%	24%	83%	21%	8%	93%	120
Bonthe	93%	87%	38%	78%	27%	5%	87%	60
Kailahun	80%	44%	37%	32%	27%	3%	24%	71
Kambia	96%	94%	42%	63%	35%	6%	97%	71
Kenema	98%	90%	41%	87%	37%	4%	95%	126
Koinadugu	90%	87%	59%	81%	59%	9%	83%	78
Kono	94%	87%	19%	69%	40%	6%	91%	90
Moyamba	93%	28%	23%	62%	68%	4%	67%	107
Port Loko	70%	18%	22%	26%	20%	2%	31%	114
Pujehun	94%	39%	11%	47%	25%	5%	48%	79
Tonkolili	57%	31%	12%	61%	13%	6%	31%	107
Western Rural	84%	29%	29%	44%	16%	5%	44%	55
Western Urban	76%	34%	41%	60%	19%	12%	40%	68
Facility type								
Hospital	95%	91%	86%	88%	75%	41%	88%	56
CHC	88%	63%	64%	75%	29%	5%	74%	224
CHP	90%	63%	20%	55%	22%	2%	67%	328
MCHP	86%	59%	17%	63%	31%	3%	66%	629
Clinic	81%	72%	40%	66%	45%	15%	72%	47
Managing authority								

Government/ Public	88%	62%	27%	64%	28%	4%	68%	1202
Private	84%	74%	65%	72%	65%	27%	76%	82
Urban/Rural								
Urban	85%	65%	44%	70%	32%	12%	72%	200
Rural	88%	62%	27%	63%	30%	4%	68%	1084
Total	88%	62%	30%	64%	31%	5%	69%	1284

Table 31: Readiness to provide comprehensive surgical services

	Materials available IMEESC*	At least 1 trained staff IMEESC*	Staff trained in surgery	Staff trained in anaesthesia	Oxygen	Anaesthesia equipment	Spinal needle	Suction apparatus	Thiopental (powder)	Suxamethonium bromide (powder)	Atropine (injectable)	Diazepam (injectable)	Halothane (inhalation)	Bupivacaine (injectable)	Lidocaine 5% (heavy spinal solution)	Epinephrine (injectable)	Ephedrine (injectable)	Percentage of facilities with all items	Mean availability of tracer items	Total number of facilities
Districts																				
Bo	43%	29%	86%	71%	86%	0%	86%	71%	43%	29%	86%	100%	71%	57%	57%	86%	71%	0%	63%	7
Bombali	20%	80%	100%	80%	40%	20%	80%	100%	60%	20%	100%	100%	20%	100%	80%	80%	100%	0%	69%	5
Bonthe	67%	33%	67%	67%	33%	0%	67%	100%	67%	33%	67%	67%	67%	0%	67%	67%	33%	0%	53%	3
Kailahun	50%	0%	100%	50%	100%	0%	100%	100%	0%	0%	100%	100%	0%	50%	50%	100%	0%	0%	53%	2
Kambia	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
Kenema	25%	25%	75%	75%	50%	25%	75%	100%	50%	50%	75%	75%	50%	75%	50%	75%	75%	0%	60%	4
Koinadugu	100%	0%	100%	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%	0%	88%	1
Kono	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1
Moyamba	0%	33%	67%	33%	67%	33%	33%	67%	0%	33%	33%	100%	33%	33%	33%	67%	33%	0%	41%	3
Port Loko	40%	20%	100%	80%	40%	20%	60%	60%	40%	20%	60%	80%	40%	60%	40%	80%	40%	20%	52%	5
Pujehun	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	94%	1
Tonkolili	33%	33%	100%	67%	67%	0%	100%	100%	0%	33%	100%	100%	33%	100%	0%	67%	67%	0%	59%	3
Western Rural	0%	0%	100%	100%	100%	0%	100%	100%	0%	0%	100%	100%	0%	100%	100%	100%	100%	0%	65%	1

Western Urban	50%	50%	80%	80%	70%	0%	70%	80%	60%	50%	70%	80%	60%	70%	50%	80%	70%	0%	63%	10
Facility type																				
Hospital	43%	40%	87%	74%	66%	15%	77%	85%	47%	36%	79%	89%	51%	68%	55%	81%	66%	6%	62%	47
Managing authority																				
Government/Public	52%	48%	90%	90%	71%	29%	86%	81%	71%	57%	86%	90%	81%	71%	48%	86%	71%	14%	71%	21
Private	35%	35%	85%	62%	62%	4%	69%	88%	27%	19%	73%	88%	27%	65%	62%	77%	62%	0%	55%	26
Urban/Rural																				
Urban	43%	43%	86%	82%	71%	14%	79%	82%	57%	43%	82%	89%	68%	71%	57%	79%	75%	4%	66%	28
Rural	42%	37%	89%	63%	58%	16%	74%	89%	32%	26%	74%	89%	26%	63%	53%	84%	53%	11%	57%	19
Total	43%	40%	87%	74%	66%	15%	77%	85%	47%	36%	79%	89%	51%	68%	55%	81%	66%	6%	62%	47

Table 32: Availability of high-level diagnostic equipment

	X-ray	ECG	Ultrasound	CT scan	Mean availability of tracer items	Total number of facilities
Districts						
Bo	29%	29%	57%	0%	29%	7
Bombali	50%	17%	50%	0%	29%	6
Bonthe	0%	0%	0%	0%	0%	3
Kailahun	0%	0%	0%	0%	0%	2
Kambia	0%	0%	0%	0%	0%	2
Kenema	0%	25%	25%	0%	13%	4
Koinadugu	100%	0%	100%	0%	50%	1
Kono	100%	0%	0%	0%	25%	1
Moyamba	0%	0%	0%	0%	0%	3

Port Loko	17%	17%	17%	0%	13%	6
Pujehun	100%	0%	100%	100%	75%	1
Tonkolili	100%	33%	100%	33%	67%	3
Western Rural	50%	50%	50%	0%	38%	2
Western Urban	15%	8%	15%	0%	10%	13
Facility type						
Hospital	28%	15%	31%	4%	19%	54
CHC	-	-	-	-	-	-
CHP	-	-	-	-	-	-
MCHP	-	-	-	-	-	-
Clinic	-	-	-	-	-	-
Managing authority						
Government/Public	32%	8%	24%	4%	17%	25
Private	24%	21%	38%	3%	22%	29
Urban/Rural						
Urban	28%	9%	34%	3%	19%	32
Rural	27%	23%	27%	5%	20%	22
Total	28%	15%	31%	4%	19%	54



Section II

Data Quality Review

1.0 Methodology

As described above, the DQR was implemented as part of the SARA and the QoC survey. As with the QoC survey, the DQR was conducted on a nationally representative sample of health facilities. Developed by WHO and its partners, the DQR uses a standard set of indicators, data collection tools, analytics, and format for the presentation of results. Implementing countries adapt the forms and tools to meet their specific needs. However, the standard DQR methodology calls for the inclusion of one indicator from each of five health programmes: maternal health, immunization, HIV/AIDS, TB, and malaria. A qualitative component, called the “Systems Assessment,” allows for the identification of weaknesses in the reporting system that contribute to data quality problems. In addition, the DQR includes a “Desk Review” – an analysis of previously reported aggregate data in the HMIS to identify gaps, inconsistencies, outliers, and other metrics designed to assess the adequacy of data used for health sector planning.

1.1 Health Programmes and Indicators

As noted, the standard DQR methodology includes the validation of five indicators from five different programme areas. Its implementation in Sierra Leone adhered nearly completely with the standard methodology; the only change was the substitution of the indicator, “currently on ART,” for “number of clients counselled and tested for HIV.” The indicator was changed to keep the workload for data collectors at health facilities to a manageable level. Another reason was that the “currently on ART” indicator was judged to be non-representative of data quality for the entire HIV programme because it is one of the most difficult indicators to compile and often has data quality problems. The resulting set of indicators for the DQR was:

- Maternal health: Number of ANC 1st visits
- Immunization: Number of 3rd dose pentavalent vaccinations
- HIV/AIDS: Number of clients counselled and tested for HIV
- TB: Number of notified TB cases
- Malaria: Number of confirmed malaria cases

1.2 Data Verification

The methodology involved the validation of reported data from health facilities for a selected reporting period (most recent complete three consecutive months) and their comparison to values reported by the same facilities for the same reporting period. The resulting statistic, the VF, is a measure of the accuracy of reporting for the indicator. The validation requires the recompilation of the selected indicators using archived data collection tools at the sampled health facilities. The reported values were abstracted from the archived monthly reporting forms (either the HMIS or the programme, depending on which database is used at a given health facility).

The following data were collected for each indicator:

- Did the facility provide the specific health service?
- Did the facility report the data to the DHMT?

- Identification of the reporting system used to report the collected data
- Identification of the source document for recording the delivery of services
- Determination of the availability of necessary source documents and reporting forms
- Recount of the indicator for three months on source documents
- Recording of the value for the indicator for the three months reported to the next level on the monthly report
- Reasons for discrepancies (if any)
- Completeness of tracer data elements in source documents (only for TB data)

At the district level, the data verification component measured the following:

- Estimate of the accuracy of reporting for the selected indicators at the district level
- Assessment of the completeness and timeliness of reporting for facilities in the district reporting to the district level
- Assessment of the completeness of indicator data in the forms submitted by health facilities

1.3 System Assessment

The system assessment measures whether the information system reporting on health service outputs has all the necessary elements to produce timely quality data, and whether these elements are functioning optimally. The assessment helps identify areas of strength and weakness, thereby facilitating the elaboration of plans and interventions for information system strengthening and improved data quality.

The system assessment was conducted at each facility in the sample of sites and at the district offices to which they report. The system assessment was qualitative, but the results are summarized as percentages. The system assessment at the facility level covered the following thematic areas:

- M&E structure and function
- Indicator definitions
- Reporting guidelines
- Data collection tools
- Reporting forms
- Data quality
- Supervision
- Data maintenance
- Confidentiality

At the district level, the system assessment examined the same thematic areas plus two additional areas:

- Demographic information
- Data use

1.4 Sampling

Whereas the SARA was conducted on a full census of health facilities, due to resource constraints, the DQR was implemented on a nationally representative sample. The priority for sampling was to have sufficient numbers of primary sampling units to judge data quality, rather than statistical power to detect significant differences through hypothesis testing. The primary sampling unit for the DQR was the service provided. Because there are more services provided than there are individuals receiving the service (i.e., some clients receive multiple services), the sampling was driven by the needs of the QoC assessment. Five records per facility were sampled randomly when the data collectors arrived at the site. The goal was to sample a minimum of 250 to 300 records for the data quality estimates for each of the four programme areas (MNCH, HIV, TB, malaria). The sampling for the DQR would therefore be more than sufficient to derive a nationally representative estimate of accuracy of reporting for the five selected indicators.

To obtain 250 to 300 records for the DQR, 50 to 60 sites for each programme area would be needed. Because most facilities provide more than one service, the same facility could be part of the sample for multiple assessments of different programme areas. For example, nearly all TB sites also offer HCT, and nearly all sites provide maternal health services and immunization.

Because not all services are offered at all health facilities and because some health events are rarer than others (for example, TB), to ensure adequate numbers for all programme areas, TB and HIV sites were oversampled. It was assumed that all facilities provided MNCH, immunization, and malaria services, and for these programme areas, a 10% sample was sought. The total sample size was 149, although 142 health facilities were ultimately surveyed. The effective sample size for each programme area was somewhat less because some sites that were expected to provide certain services did not.

Table 33 presents the sample sizes and the distribution of sites among the five programme areas for the DQR.

Table 33: Distribution of health facilities in the sample, by programme area

Programme Area	Total in country	Total in sample	Sampling fraction	Provide service	Report to MOHS	Documents available
Maternal health	1300	149	11%	136	136	96
Immunization	1300	149	11%	133	133	106
HIV Services	664	83	13%	87	86	57
TB Services	160	47	29%	47	47	35
Malaria Services	1300	149	11%	141	141	108

1.5 Data collection and cleaning

Data collectors and supervisors were trained in Freetown in February 2017. A total of 80 data collectors and 20 supervisors were trained. Each supervisor was responsible for ensuring the implementation of the QoC survey and DQR by two teams of two data collectors each.

Supervisors were primarily responsible for implementing the DQR and QoC assessment at facilities that fell into the sample. The data collection teams, each assigned to assess approximately 32 health facilities, spent about six weeks in the field.

Data were collected on tablet computers (both Android and Windows operating systems) and were uploaded electronically from the field when a connection to the internet was available. Data collection used the standard CSPro 6.3 data entry applications for the SARA and DQR. Custom QoC modules were developed by the Sierra Leone SARA+ organizing committee for use in Sierra Leone. (The QoC modules were then shared with the WHO and Global Fund for their use in other countries.) Data were compiled from the central server in Freetown and concatenated using standard tools embedded in the CSPro 6.3 data management system. Custom batch files distributed with the SARA 2.2 application in CSPro were used to assess data completeness, and periodic summaries were sent to central data managers at the MOHS in Freetown for follow up on identified gaps and problems.

1.6 Survey validation

Concurrent with the survey implementation, an independent team of assessors circulated in the country to re-administer the surveys for SARA, DQR and QoC at a 5% sample of sites. These records were then compared with original records compiled by the survey teams and a percentage match was calculated for each data element and overall for facilities.

1.7 Data Analysis

The data analysis for the DQR used the standard DQR Chartbook from WHO. The DQR Chartbook is an MS Excel workbook that produces standard tables of results by programme area and for the system assessment. A custom CSPro batch file was used to calculate indicators from the raw DQR data. The resulting data were then pasted into the Chartbook, which compiles the indicators and presents them in tables automatically.

The DQR data collection tools used were the version available from the Global Fund tool repository for HFA Service Providers in January 2017 (just prior to tool adaptation in Sierra Leone). An updated version of the data collection tools became available the next month and the DQR Chartbook was developed by WHO based on the newer version of the data collection tools. Hence, the DQR Chartbook available for use in Sierra Leone did not conform to the data collected for the DQR during the Sierra Leone HFA. It was therefore necessary to customize the Chartbook to conform with the data collected for the DQR in Sierra Leone. For some data, such as the system assessment, the tools were markedly different and certain data elements called for in the Chartbook were not collected in Sierra Leone (for example, reasons for missing monthly reports).

1.8 Weighting of data

The data were weighted according to the distribution of facility type in the country. The weights were calculated by dividing the number of each type of facility in the sample by the number of such facilities in the country according to the MFL available for the SARA. The results were further weighted by applying factors to account for non-coverage (those facilities that were supposed to provide a service but did not) and non-response (facilities that were supposed to report service delivery but did not).

1.9 Desk Review of HMIS Data

The DQR Desk Review is an analysis of previously reported aggregate data in the HMIS to identify gaps, inconsistencies and outliers in the data. The Desk Review uses standard metrics across four domains:

- Completeness and timeliness of data
- Internal consistency (including extreme values, consistency over time, and consistency between related indicators)
- External consistency (e.g., comparison of values from routine data sources with population-based survey data)
- Consistency of denominators

The Desk Review was performed on the local instance of the DHIS 2 using an “app” available in the DHIS 2 program. Population-based survey values comparable to DQR primary indicators were not available at the time of the SARA+, and denominator data were similarly limited. Therefore, analyses for domains three and four listed above were not conducted.

The data examined for each indicator were the most recent complete year of reported data, disaggregated by month and district. District monthly values exceeding a pre-defined indicator-specific threshold are highlighted for follow-up.

1.10 Presentation of results

Results are presented as percentages for most indicators, the main exception being the VF for the estimate of reporting accuracy, which is a ratio statistic. Because of the sample size, results are generalizable only at the national level. Results are presented disaggregated by region (four regions), health facility type (4), management authority (2), and milieu (whether the facility is urban or rural (2) to give a more complete picture of the results. The national level estimates are listed by indicator in Table 59 in Annex II.

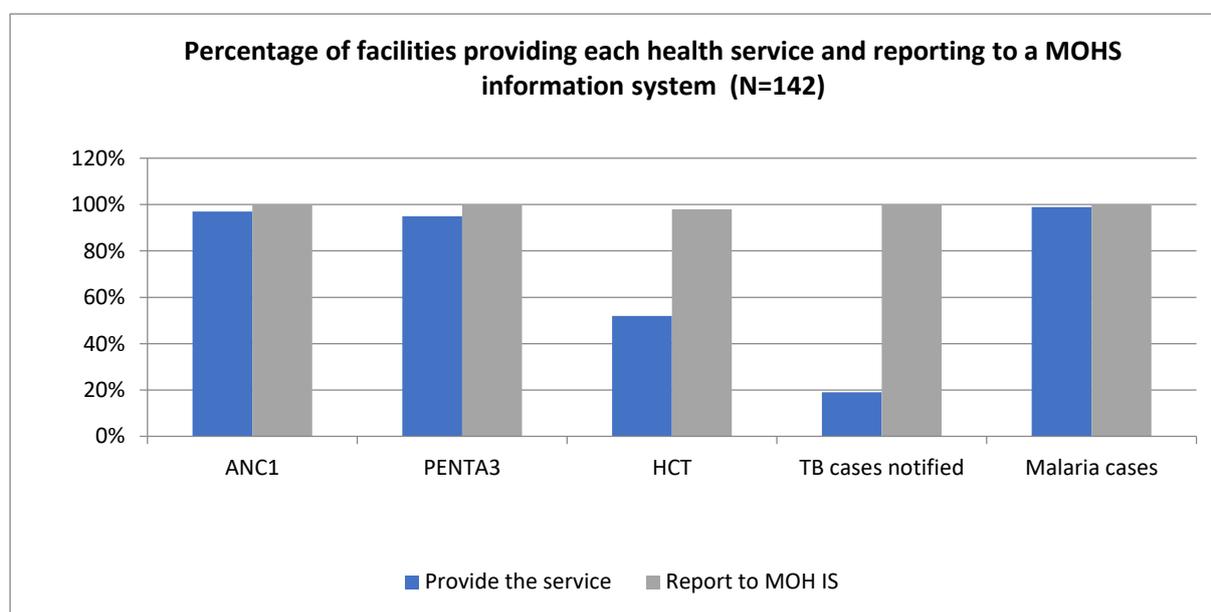
A data analysis workshop was conducted in Freetown in May 2017 to review the results with representatives of the different health programmes to determine whether the results were plausible and in line with expectations.

2.0 Results

2.1 Data Verification

2.1.1 Health Facility Level

Figure 78: Distribution of health services



2.1.2 Distribution of Services

Figure 78 shows the distribution of the provision of health services across the five tracer indicators and the percentage of those facilities providing the service that also report to an MOHS information system (IS). Although not all health facilities provide all the services, most facilities that provide the services also report to the MOHS. Table 34 presents the percentage of facilities providing services for each programme area. The total row shows the nationally representative estimates for the indicator by programme area. Services were generally widely available, although less so for TB and HIV. Within HIV, services were somewhat less available in the Southern and Northern regions, compared with the Western and Eastern regions. HIV services were more widely available in private health facilities than in public, although the number of private health facilities was small compared with government-run facilities. Notably, immunization services were somewhat less available in urban areas than in rural areas.

Table 34: Percentage of facilities providing each health service, by facility type, managing authority, and milieu (N=142)

	Maternal Health	Immunization	HCT	TB	Malaria	Total number of facilities
Region						
Western	90%	77%	60%	17%	100%	19
Eastern	95%	95%	60%	18%	96%	31
Southern	99%	99%	49%	17%	100%	45
Northern	99%	99%	47%	24%	100%	47
Facility type						
Hospital	73%	64%	91%	82%	100%	11
CHC	98%	98%	95%	86%	100%	42
CHP	94%	89%	60%	6%	97%	35
MCHP	100%	100%	30%	0%	100%	54
Managing authority						
Government/Public	97%	95%	51%	20%	99%	135
Private	94%	89%	73%	11%	100%	7
Urban/Rural						
Urban	91%	86%	67%	24%	100%	30
Rural	99%	97%	49%	18%	99%	112
Total	97%	95%	52%	19%	99%	142

2.1.3 Availability of source documents

The DQR at health facilities depends on the availability of historical source documents to recompile indicator values for comparison with the values reported by the sites for the selected reporting period. However, data archiving is often problematic in developing countries.

Figure 79: Availability of documents, agreement between sources, and data element completeness

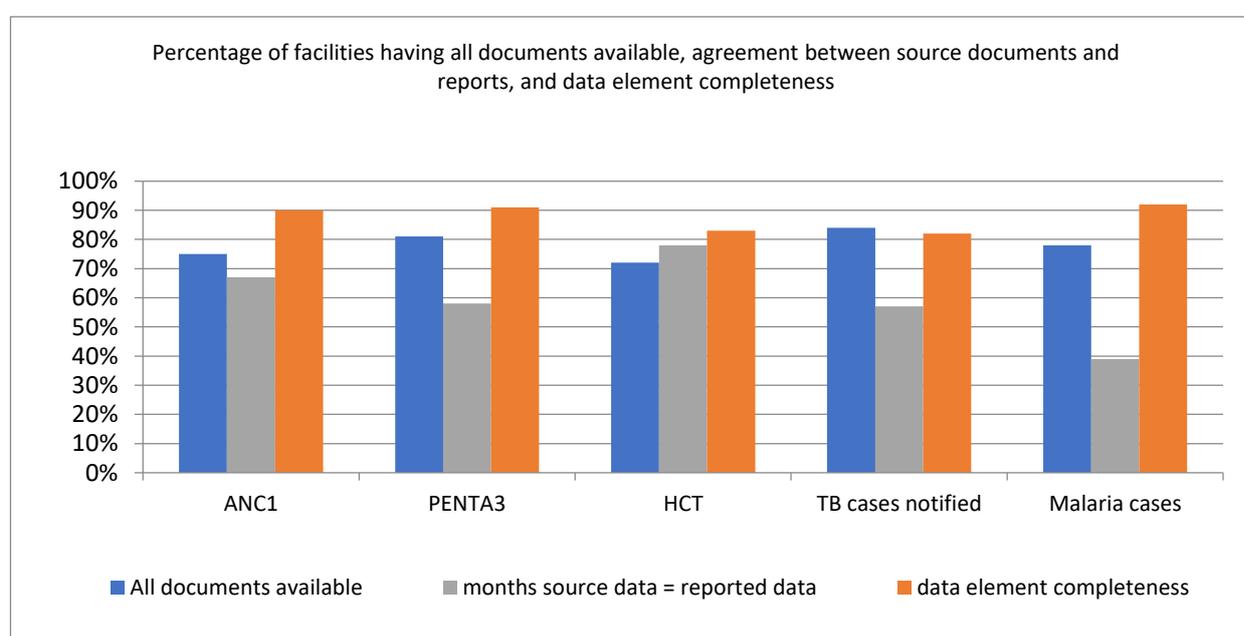


Figure 79 displays the results of the assessment of the availability of source documents at the sampled health facilities, by programme area.

TB source documents were available most often (84%), followed by immunization (81%). HCT source documents were the least available at sampled health facilities (72%). The Western region had lower availability of source documents compared with other regions, potentially because there are more hospitals in the Western region than in other regions, and hospitals often follow different data management procedures than primary health care centres. A look at the distribution of the availability of source documents at hospitals bears this out; source documents were less available for maternal health and malaria (Table 35).

Table 35: Among facilities providing a specific service and reporting on that service, percentage of facility-months for which the source documents and monthly reports could be located by the survey team, by region, facility type, managing authority, and milieu

	Maternal Health (N=136)	Immunization (N=133)	HIV (N=86)	TB (N=47)	Malaria (N=141)
Regions					
Western	60%	73%	58%	91%	59%
Eastern	73%	76%	69%	80%	78%
Southern	86%	87%	72%	81%	90%
Northern	73%	79%	81%	85%	73%
Facility type					
Hospital	63%	86%	80%	89%	76%
CHC	85%	85%	71%	85%	82%
CHP	73%	76%	63%	75%	74%
MCHP	74%	81%	80%	-	79%
Managing authority					
Government/Public	77%	82%	72%	83%	80%
Private	42%	54%	65%	100%	33%
Urban/Rural					
Urban	60%	78%	68%	85%	60%
Rural	79%	81%	73%	84%	82%
Total	75%	81%	72%	84%	78%

2.1.4 Data Element Completeness

The performance of health service delivery cannot be assessed if data are not available; it is not sufficient for health facilities to send their monthly reports to the next level. The data on the forms need to be complete to provide the full picture of service delivery. Table 36 shows the distribution of data element completeness by programme area, disaggregated by region, facility type, management authority, and milieu for facilities providing the service and reporting data. National-level estimates (totals row) for HIV and TB have the lowest data element completeness (83% and 82%, respectively). Maternal health, immunization, and malaria services have data element completeness above 90%.

Table 36: Among facilities providing a specific service and reporting data, percentage of facility-months that had data for the indicators in their monthly reports, by region, facility type, managing authority, and milieu

	Maternal Health (N=136)	Immunization (N=133)	HIV (N=86)	TB (N=47)	Malaria (N=141)
Regions					
Western	68%	75%	65%	100%	84%
Eastern	94%	99%	91%	82%	99%
Southern	95%	92%	83%	78%	94%
Northern	91%	92%	86%	80%	87%
Facility type					
Hospital	75%	95%	80%	78%	88%
CHC	98%	95%	81%	89%	94%
CHP	92%	95%	76%	50%	90%
MCHP	87%	88%	93%	-	92%
Managing authority					
Government/Public	91%	92%	84%	82%	92%
Private	65%	77%	65%	100%	73%
Urban/Rural					
Urban	76%	87%	72%	88%	81%
Rural	93%	92%	86%	81%	94%
Total	90%	91%	83%	82%	92%

CHPs had the lowest data element completeness (the average across programme areas was 81%) followed by hospitals (83%). The maternal health and TB data element completeness for hospitals was lower than for other programme areas at hospitals. The Western region had the lowest data element completeness (78%), whereas the Eastern region had consistently high data element completeness (93%) relative to the other regions. Rural health facilities had higher data element completeness (average across programme areas: urban was 81%; rural was 89%). Government sites had consistently higher data element completeness than private sites.

2.1.5 Missing TB Data

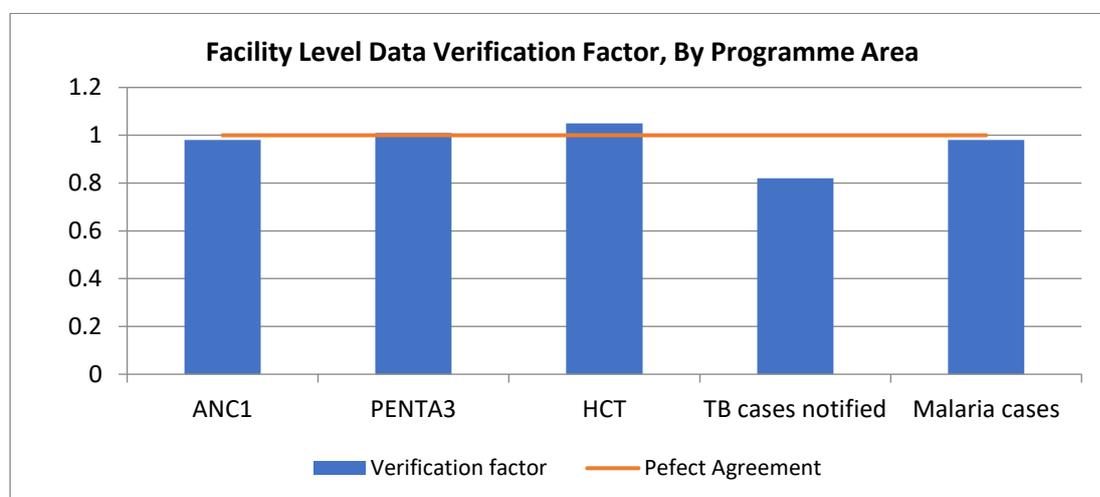
The assessment of TB data element completeness was more comprehensive than for other programme areas because this metric is a standard feature of TB control programme quality monitoring. Among tracer data elements, disease classification had the lowest data element completeness (25%), followed by “type of patient” (24%). Twenty-six percent (26%) of all TB sites in the sample had missing data for the tracer elements (Table 37).

Table 37: Percentage missing data, by TB data element (N = 47 health facilities)

Data Element	Percentage missing data
Year of registration	13%
Sex	7%
Age	18%
Disease classification	25%
Type of patient	24%
Bacteriological results	12%
At least one missing variable	15%
Proportion of facilities with cases having missing data	26%
Total number of facilities	47

2.1.6 Accuracy of Reporting (Verification Factor)

Figure 80: Verification factors for tracer Indicators



The accuracy of reporting was high across programme areas (Figure 80). Perfect agreement between validated and reported values yields a VF of 1.0. Only TB had a VF greater than 5% discordance between validated and reported values (82%). VFs less than 1.0 indicate over-reporting of service delivery, whereas those above 1.0 indicate under-reporting. TB therefore over-reported service delivery by approximately 18%. Much of this appears to be at CHCs (VF = 0.77, compared with 1.04 for hospitals) (Table 38). ANC 1st visit appeared to be under-reported by facilities in the Western region (VF = 1.22) as compared with other regions. Malaria cases appeared to be under-reported by hospitals (VF = 1.79) compared with other types of facilities.

Table 38: Facility level data verification factor, by region, facility type, managing authority, and milieu

	ANC 1 st Visit (N=96)	3rd Dose pentavalent vaccine (N=106)	HCT (N=57)	Notified cases of TB (N=35)	Malaria cases (N=108)
Regions					
Western	1.22	0.96	0.99	0.85	0.97
Eastern	0.98	1.00	1.13	0.83	1.07
Southern	0.96	1.02	1.12	0.75	0.97
Northern	0.96	1.03	0.96	0.86	0.94
Facility type					
Hospital	0.98	0.90	0.97	1.04	1.79
CHC	0.96	1.02	1.00	0.77	0.96
CHP	1.00	0.95	1.12	1.00	0.95
MCHP	0.99	1.05	1.06	-	0.97
Managing authority					
Government/Public	0.96	1.02	1.05	0.82	0.98
Private	2.10	0.96	1.00	0.96	1.00
Urban/Rural					
Urban	1.08	0.94	0.96	0.96	0.95
Rural	0.97	1.03	1.08	0.79	0.99
Total	0.98	1.01	1.05	0.82	0.98

Table 39 shows the distribution of perfect match between source documents and reported results for each month reviewed (a total of three months were reviewed). It is not expected to have a perfect match between the source documents and reported results because some errors always occur in public health information systems. The degree of perfect matching is therefore indicative of data management performance. HCT had the highest degree of perfect matching between validated and reported results (78%), whereas malaria had the lowest degree of matching (39%). The Eastern region had the highest percentage matching among the regions (69%, average across programme areas), whereas CHPs had the highest percentage matching among health facility types (71%).

Table 39: Among facilities providing a specific service, reporting on that service, and with all source documents and monthly reports available, percentage of facility-months for which the sum of source data was exactly equal to the reported data, by region, facility type, management authority, and urban rural

	ANC (N=96)	DTP3/PENTA (N=106)	HCT (N=57)	Notified cases of TB (N=35)	Malaria cases (N=108)
Regions					
Western	62%	60%	89%	0%	61%
Eastern	85%	76%	69%	75%	41%
Southern	76%	60%	77%	54%	44%
Northern	46%	45%	81%	67%	23%
Facility type					
Hospital	67%	61%	79%	57%	63%
CHC	59%	51%	81%	52%	33%
CHP	78%	59%	67%	100%	49%
MCHP	62%	61%	83%	-	33%
Managing					
Government/Public	67%	59%	78%	57%	37%
Private	26%	44%	87%	50%	100%
Urban/Rural					
Urban	52%	54%	79%	57%	50%
Rural	68%	59%	78%	57%	36%
Total	67%	58%	78%	57%	39%

2.1.7 Antenatal Care 1st Visit

In a sample of health facilities, it is likely to find some facilities that over-report ($VF < 1.0$) and some that under-report ($VF > 1.0$). Summarizing the VFs across health facilities involves adding the recounted (or validated) values and dividing by the sum of the reported values across facilities. This tends to mask, or wash out, the degree of over- and under-reporting in the sample. Although the VFs will trend toward 1.0, or a perfect match, when summarizing across health facilities (particularly in the absence of systematic over- or under-reporting) and when calculated for a large enough sample, the VF is an accurate representation of the accuracy of reporting for all sites offering the service in a country. It is therefore instructive to calculate the percentage of sites that over- or under-report to a significant degree. Figure 81 shows the distribution of over- and under-reporting in the sample, by programme area.

Figure 81: Accuracy metrics for tracer indicators

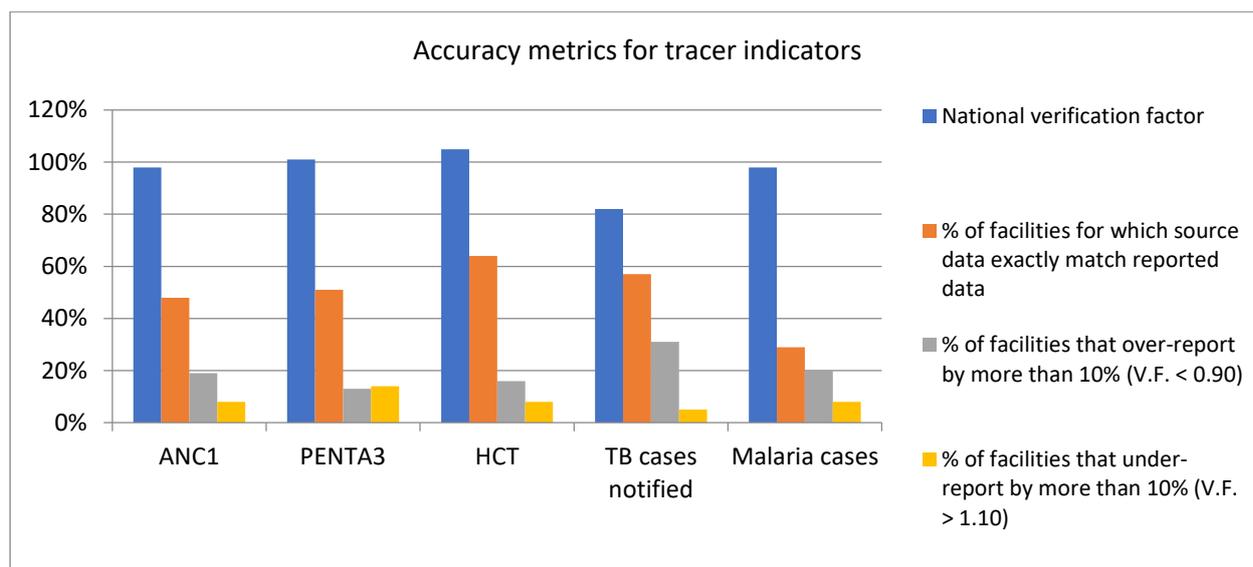


Table 40 displays the percentage of health facilities that over- and under-reported by more than 10%, and the degree of perfect matching across all three months reviewed (that is, a VF of 1.0) for the maternal health ANC 1st visit indicator.

Table 40: ANC 1st visit facility level data verification factor indicators, by region, facility type, managing authority, and milieu (N=96)

	National verification factor	% of facilities for which source data exactly matched reported data	% of facilities that over-reported by more than 10% (V.F. < 0.90)	% of facilities that under-reported by more than 10% (V.F. > 1.10)	Number of facilities
Regions					
Western	1.22	26%	18%	17%	8
Eastern	0.98	65%	9%	7%	20
Southern	0.96	57%	16%	9%	35
Northern	0.96	32%	30%	6%	33
Facility type					
Hospital	0.98	60%	20%	0%	5
CHC	0.96	41%	16%	6%	32
CHP	1.00	48%	14%	10%	21
MCHP	0.98	50%	24%	8%	38
Managing authority					
Government/Public	0.96	48%	20%	7%	94
Private	2.10	26%	0%	74%	2
Urban/Rural					
Urban	1.08	25%	29%	29%	12
Rural	0.97	51%	18%	5%	84
Total	0.98	48%	19%	8%	96

Fully 48% of sites in the sample had a perfect match between values validated on source documents and results reported by the facilities for the three months taken together, a remarkable result. Accuracy of reporting was high for ANC 1st visit, although 19% of sites over-reported by more than 10%.

2.1.8 3rd Dose Pentavalent Vaccine

Results for the data verification of the 3rd dose of pentavalent vaccine (Penta 3) indicator are presented in Table 41. The accuracy of reporting nationally was 101%. Fifty-one percent (51%) of facilities in the sample had exact correspondence between source documents and reported results (VF = 1.0) for the three months of data. Only 13% of facilities over-reported by 10%, and just 14% of facilities under-reported by 10%.

Table 41: PENTA3 facility level data verification factor indicators, by region, facility type, managing authority, and milieu (N=106)

	National verification factor	% of facilities for which source data exactly matched reported data	% of facilities that over-reported by more than 10% (V.F. < 0.90)	% of facilities that under-reported by more than 10% (V.F. > 1.10)	Number of facilities
Regions					
Western	0.96	46%	11%	0%	10
Eastern	1.00	75%	6%	11%	22
Southern	1.02	56%	9%	16%	37
Northern	1.03	32%	21%	18%	37
Facility type					
Hospital	0.90	50%	33%	0%	6
CHC	1.02	41%	26%	21%	34
CHP	0.95	52%	17%	4%	23
MCHP	1.05	53%	5%	19%	43
Managing authority					
Government/Public	1.02	52%	13%	15%	103
Private	0.96	16%	0%	0%	3
Urban/Rural					
Urban	0.94	45%	19%	6%	19
Rural	1.03	52%	12%	16%	87
Total	1.01	51%	13%	14%	106

The Eastern region led other regions in the percentage of facilities with perfect agreement between source documents and reports (75%). Hospitals had somewhat less accurate reporting as compared with other facility types (VF = 0.9).

2.1.9 Number of people counselled and tested for HIV

Table 42 shows the data verification results for the number of people counselled and tested for HIV. The overall VF for HCT was 1.05, or a 5% under-reporting of results (that is, more people received the service according to the source documents than were reported as receiving the

service in monthly reports). Sixty-four percent (64%) of sites reported no discrepancies and only 16% of sampled sites over-reported by more than 10%. Just 8% of sites under-reported by more than 10%.

Table 42: HCT facility level data verification factor indicators, by region, facility type, managing authority, and milieu (N=57)

	National verification factor	% of facilities for which source data exactly matched reported data	% of facilities that over-reported by more than 10% (V.F. < 0.90)	% of facilities that under-reported by more than 10% (V.F. > 1.10)	Number of facilities
Regions					
Western	0.99	75%	4%	0%	8
Eastern	1.13	67%	10%	18%	13
Southern	1.12	47%	24%	8%	16
Northern	0.96	73%	20%	4%	20
Facility type					
Hospital	0.97	63%	13%	0%	8
CHC	1.00	69%	8%	8%	26
CHP	1.12	55%	27%	9%	11
MCHP	1.06	67%	17%	8%	12
Managing					
Government/ Public	1.05	63%	17%	8%	54
Private	1.00	87%	0%	0%	3
Urban/Rural					
Urban	0.96	70%	14%	0%	15
Rural	1.08	63%	17%	10%	42
Total	1.05	64%	16%	8%	57

2.1.10 Number of TB cases notified

For the TB indicator (number of TB cases notified), the national reporting accuracy (VF) was 82% (Table 43). TB reporting is done quarterly, so the degree of matching of source documents and reports was calculated for just one reporting period (three months). Whereas 57% of TB sites were found to have perfect agreement between recounted and reported results (VF = 1.0), 31% of sites over-reported by more than 10%. Only 5% of sites under-reported by more than 10%.

Table 43: TB facility level data verification factor indicators, by region, facility type, managing authority, and milieu (N=35)

	National verification factor	% of facilities for which source data exactly matched reported data	% of facilities that over-reported by more than 10% (V.F. < 0.90)	% of facilities that under-reported by more than 10% (V.F. > 1.10)	Number of facilities
Regions					
Western	0.85	0%	47%	15%	5
Eastern	0.83	75%	25%	0%	7
Southern	0.75	54%	35%	0%	9
Northern	0.86	67%	26%	7%	14
Facility type					
Hospital	1.04	57%	14%	14%	7
CHC	0.77	52%	37%	4%	27
CHP	1.00	100%	0%	0%	1
MCHP	-	-	-	-	0
Managing					
Government/Public	0.82	57%	32%	5%	33
Private	0.96	50%	0%	0%	2
Urban/Rural					
Urban	0.96	57%	26%	9%	9
Rural	0.79	57%	32%	4%	26
Total	0.82	57%	31%	5%	35

2.1.11 Confirmed Malaria Cases

The national VF for confirmed malaria cases was 98% (Table 44). Twenty-nine percent (29%) of sites had a perfect match between source documents and reports for the three-month period. Twenty percent (20%) of sites over-reported by more than 10%, whereas just 8% of sites under-reported by more than 10%.

The VF for confirmed malaria cases for hospitals showed 79% under-reporting, probably due to a missing monthly report (that is, more cases were found in source documents than in monthly reports). Interestingly, 63% of hospitals were found to have an exact match between source documents and reports for the three months verified.

Table 44: Malaria facility level data verification factor indicators, by region, facility type, managing authority, and milieu (N=108)

	National verification factor	% of facilities for which source data exactly matched reported data	% of facilities that over-reported by more than 10% (V.F. < 0.90)	% of facilities that under-reported by more than 10% (V.F. > 1.10)	Number of facilities
Regions					
Western	0.97	48%	0%	0%	11
Eastern	1.07	29%	16%	7%	23
Southern	0.97	34%	20%	5%	40
Northern	0.94	16%	30%	15%	34
Facility type					
Hospital	1.79	63%	13%	13%	8
CHC	0.96	24%	24%	9%	34
CHP	0.95	36%	20%	4%	25
MCHP	0.97	24%	20%	10%	41
Managing authority					
Government/Public	0.98	27%	21%	8%	105
Private	1.00	100%	0%	0%	3
Urban/Rural					
Urban	0.95	39%	14%	0%	19
Rural	0.99	27%	21%	9%	89
Total	0.98	29%	20%	8%	108

Figure 82: Reasons for discrepancy in reporting for tracer indicators

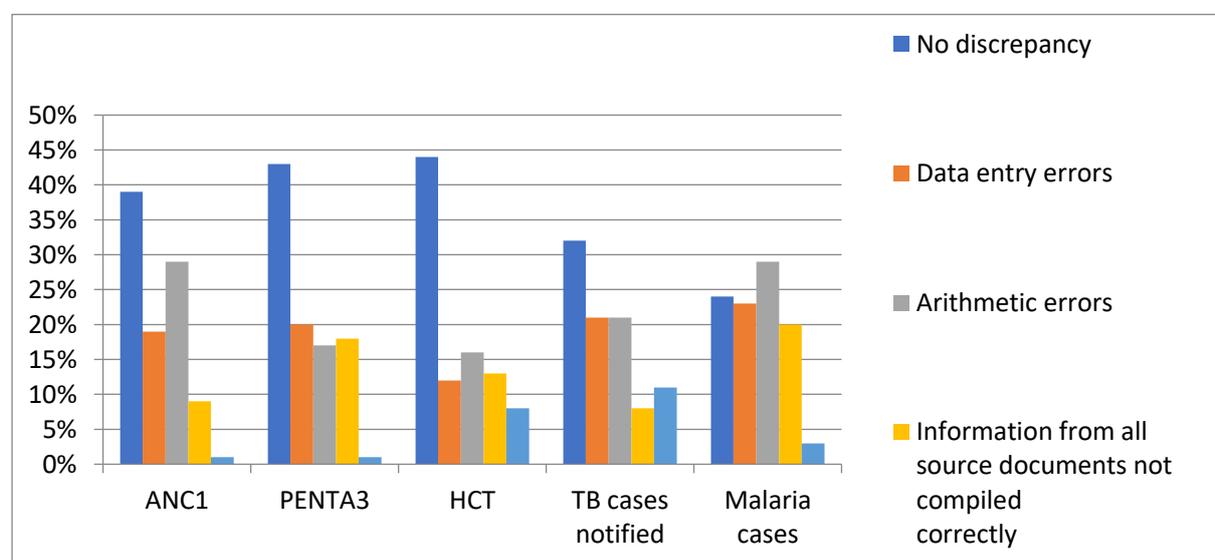


Figure 82 presents the reasons for discrepancy for the five tracer indicators. No discrepancy was reported most often, for nearly 45% of facilities for HCT and Penta3. The most commonly cited reason for discrepancy was arithmetic errors, followed by data entry errors. For ANC, the most prominent reason for discrepancies was arithmetic errors (29%), followed by data entry errors (19%). However, 39% of sites reported no discrepancy. For immunization, 43% of facilities reported no discrepancies, whereas 20% said that data entry errors were the cause of discrepancy. Seventeen percent (17%) of facilities cited arithmetic errors for discrepancies, and 18% cited incorrect data compilation from source documents for the mismatch between source documents and reports.

No discrepancies were reported by 44% of facilities for HCT. Arithmetic errors were cited most frequently (16%), followed by data entry errors (12%). Thirteen percent (13%) of sites reported incorrect indicator compilation as the reason for discrepancy in reporting for HCT.

Thirty-two percent (32%) of TB sites reported no discrepancies. Data entry errors and arithmetic errors were both cited as the causes of discrepancies in 21% of sites. Missing source documents or monthly reports were cited as the cause of inaccuracy in 11% of sites.

Twenty-four percent (24%) of facilities providing malaria services reported no discrepancy; however, 29% cited arithmetic errors as the leading cause of disparities between source documents and reports. Data entry errors were cited in 23% of malaria facilities, whereas 20% cited problems with indicator compilation as the cause. Just 3% reported missing source documents or reports as the cause for discrepancies.

2.2 District Level

2.2.1 Data Verification, Timeliness, and Completeness

The DHMT offices were assessed for data quality (Table 45). Missing records impaired the ability to draw definitive conclusions. Just nine of fourteen district offices contributed results.

Table 45: District level data verification and reporting performance (N=9)

Indicator	District Verification Factor	Completeness of reporting	Timeliness of reporting	Completeness of data elements
ANC 1st visit	99%	98.9%	84.5%	100.0%
Penta 3rd dose	100%	99.2%	84.4%	100.0%
HCT	100%	98.9%	84.1%	98.2%
TB cases notified	100%	99.3%	86.6%	97.5%
Confirmed malaria cases	100%	99.2%	85.9%	100.0%

The data at the district level were found to be of quite high quality, as seen by a VF of 100% for four of five indicators. Completeness of reporting was also high, nearly 100% for all indicators. Timeliness of reporting, as it often does, lagged behind completeness, in the range of 84% to 86% across the indicators. The evaluation of completeness of data elements was similarly high, although with some doubts about the accuracy of the appraisal since three of five indicators had percentages higher than 100% (results in the table above are truncated to 100%).

Reasons for discrepancies generally followed the reasons reported for facility level reporting, with data entry errors cited most frequently (33% for ANC and malaria), followed by arithmetic errors (10% each for HCT, TB, and malaria) (data not shown).

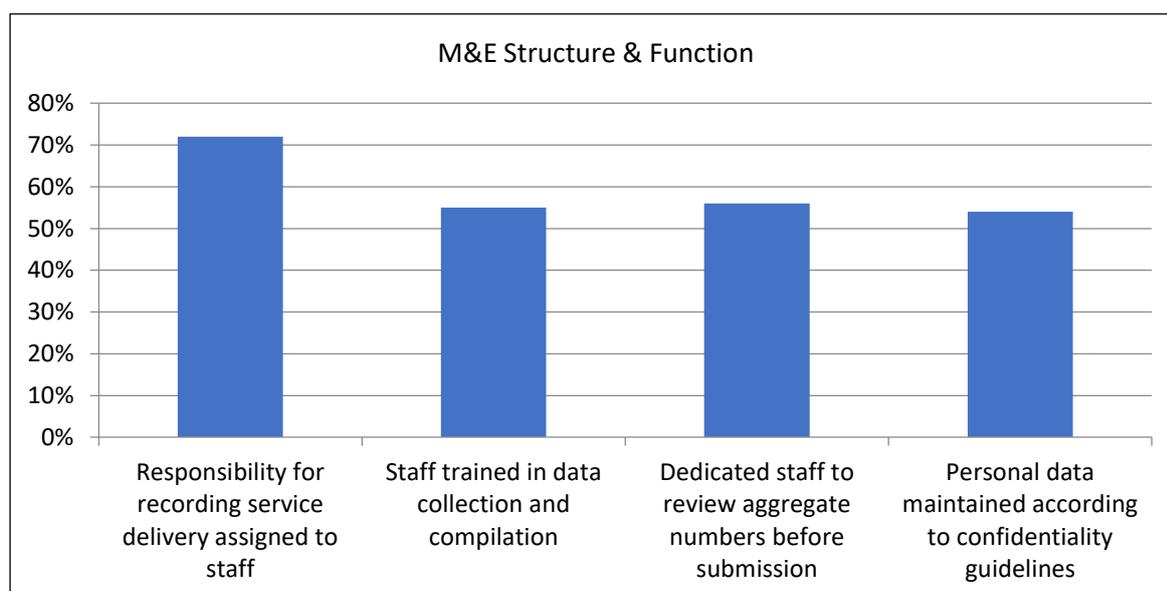
2.3 M&E System Assessment

2.3.1 Health Facility Level

2.3.1.1 M&E Structure & Function

Figure 83 and Table 46 show the results of the system assessment for the M&E structure and function category. Responsibility for recording service delivery was assigned to a specific staffer at 72% of sampled facilities. At 55% of facilities, staff had received the appropriate training. At a similar percentage of sites (56%), staff were reported to have been assigned to review compiled results prior to submitting the report to the next level.

Figure 83: System Assessment - M&E Structure and Function



Responsibility for service delivery recording was assigned to a specific staff person at only 42% of sampled facilities in the Eastern region (contrasting markedly with the Southern region, at 96%) (Table 46). In 82% of hospitals, staff were trained in data collection and compilation as opposed to just 52% at CHCs and 51% at CHPs. Staff were trained in 94% of sampled private facilities as compared with 54% of public facilities.

Table 46: Percentage of facilities that reported health data to a MOHS reporting system with tracer items for data management, by facility type, managing authority, and milieu (N=142) - M&E Structure & Function

M&E Structure & Function	Responsibility for recording service delivery assigned to staff	Staff trained in data collection and compilation	Dedicated staff to review aggregate numbers before submission	Total number of facilities
Region				
Western	75%	48%	43%	19
Eastern	42%	46%	53%	31
Southern	96%	59%	53%	45
Northern	67%	62%	65%	47
Facility type				
Hospital	82%	82%	55%	11
CHC	74%	52%	69%	42
CHP	71%	51%	57%	35
MCHP	70%	57%	50%	54
Managing authority				
Government/Public	71%	54%	56%	135
Private	94%	94%	49%	7
Urban/Rural				
Urban	70%	61%	44%	30
Rural	72%	54%	58%	112
Total	72%	55%	56%	142

2.3.1.2 Indicator Definitions

Standard indicator definitions ensure that all sites are collecting comparable information. The distribution of the use of standard indicator definitions by programme area is presented in Figure 84 (and Table 47, by relevant stratifiers). Between 70% and 80% of all sampled health facilities reported using standard indicator definitions for all indicators (Figure 84). However, only 50% of the sampled hospitals reported using standard definitions for ANC 1st visit (Table 47). Only 55% of sampled sites in the Southern region were found to have standard indicator definitions for ANC 1st visit. Oddly, only 51% of sampled urban TB sites reported using standard indicator definitions as compared with rural TB sites.

Figure 84: Use of standard indicator definitions

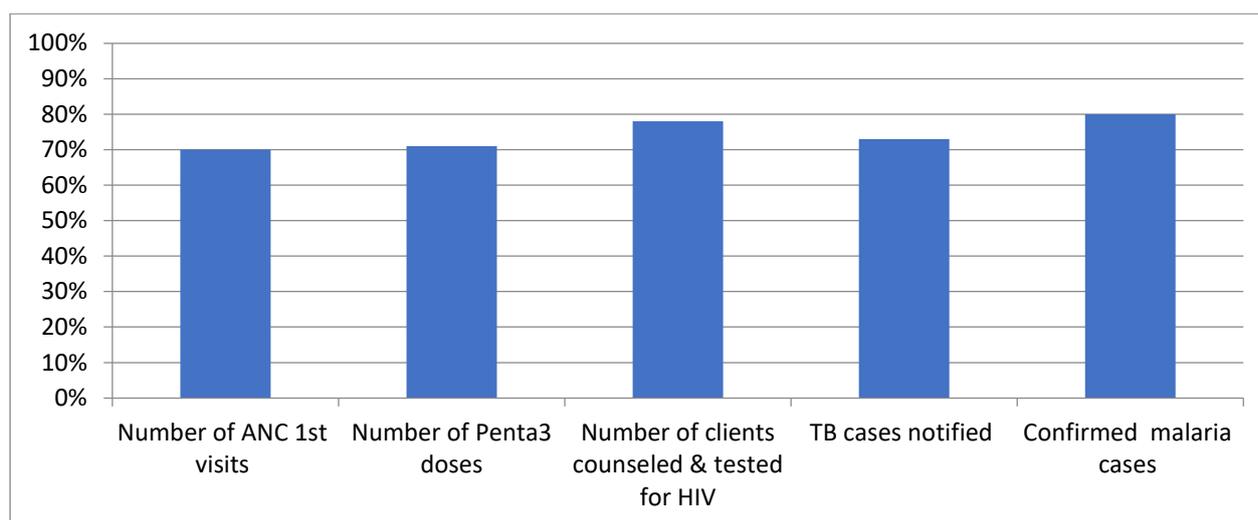
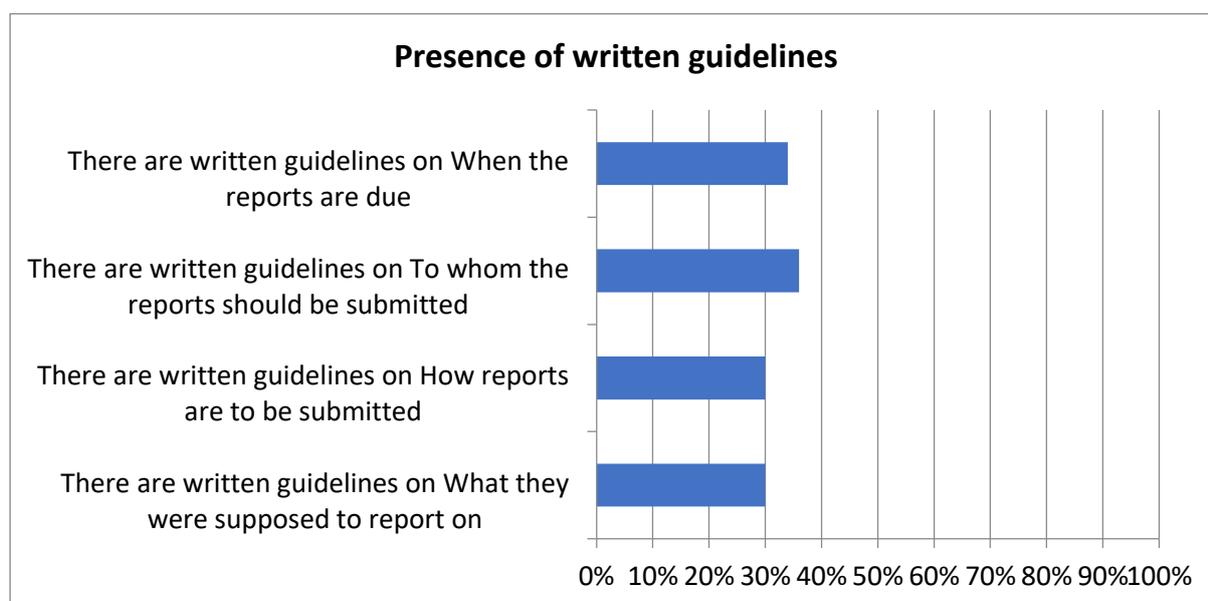


Table 47: Percentage of facilities that reported health data to a MOHS reporting system with tracer items for data management, by facility type, managing authority, and milieu (N=142) – Indicator definitions

Indicator Definitions	Number of ANC1 visits-standard definition	Number of Penta3-standard definition	Current on HCT-standard definition	TB cases treatment-standard definition	Malaria cases standard definition	Total number of facilities
Region						
Western	77%	73%	88%	69%	82%	19
Eastern	74%	68%	73%	56%	70%	31
Southern	55%	64%	67%	54%	82%	45
Northern	79%	79%	87%	95%	82%	47
Facility type						
Hospital	50%	57%	70%	78%	82%	11
CHC	73%	76%	78%	69%	86%	42
CHP	82%	81%	81%	100%	85%	35
MCHP	63%	65%	75%	-	74%	54
Managing authority						
Government/Public	70%	71%	78%	72%	81%	135
Private	73%	77%	73%	100%	60%	7
Urban/Rural						
Urban	78%	77%	71%	51%	82%	30
Rural	68%	70%	80%	80%	79%	112
Total	70%	71%	78%	73%	80%	142

2.3.1.3 Reporting Guidelines

Figure 85: Guidelines for RHIS data management and reporting



Standard guidelines on reporting help ensure uniformity in data collection, compilation and reporting. Such standardization helps ensure better data quality. Figure 85 (and Table 48, by relevant stratifiers) show the distribution of responses for indicators on the availability of written guidelines for reporting at the sampled health facilities.

Only 30% of sampled sites reported having written guidelines on what they were supposed to report, or how reports were to be submitted (Fig. 85). Only 36% of sites said that they had guidelines on where to send the reports, and 34% reported that guidance was available for when the reports were due.

Table 48: Percentage of facilities that reported health data to a MOHS reporting system with tracer items for data management, by facility type, managing authority, and milieu (N=142) - Reporting guidelines

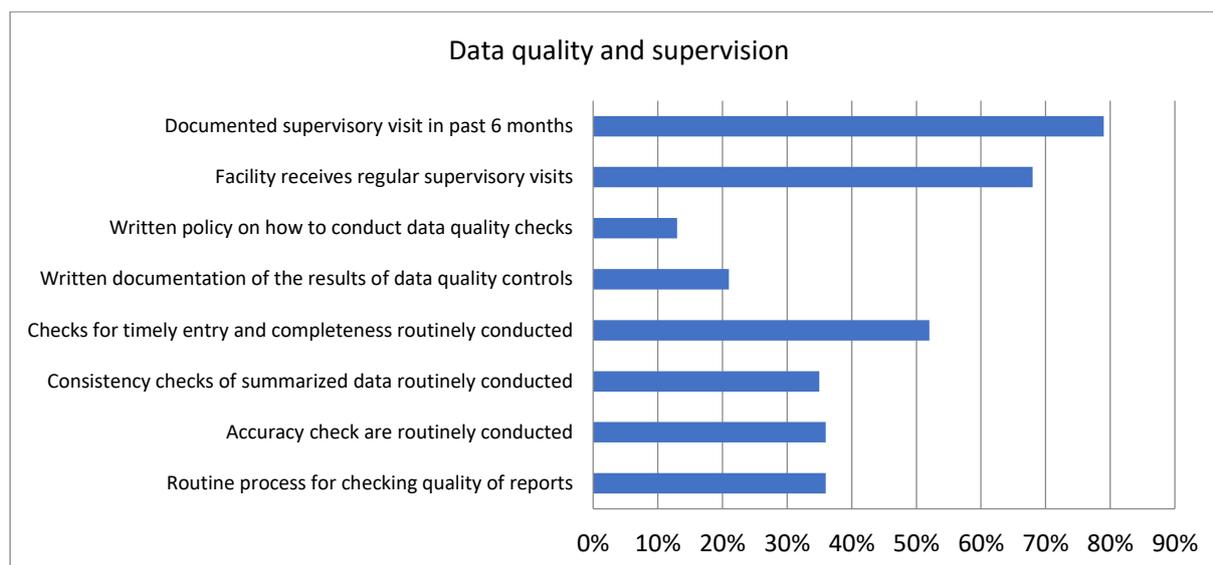
Reporting Guidelines	There are written guidelines on What they were supposed to report on	There are written guidelines on How reports were to be submitted	There are written guidelines on to whom the reports should be submitted	There are written guidelines on When the reports were due	Total number of facilities
Region					
Western	27%	31%	45%	31%	19
Eastern	34%	31%	37%	37%	31
Southern	13%	11%	14%	14%	45
Northern	44%	45%	54%	53%	47
Facility type					
Hospital	36%	45%	55%	45%	11
CHC	36%	29%	31%	31%	42
CHP	29%	31%	40%	37%	35
MCHP	28%	28%	35%	33%	54
Managing authority					
Government/ Public	29%	29%	36%	34%	135
Private	43%	49%	54%	49%	7
Urban/Rural					
Urban	31%	38%	50%	45%	30
Rural	29%	28%	33%	32%	112
Total	30%	30%	36%	34%	142

The Southern region showed the greatest lack of available written reporting guidelines (13% average across indicators), whereas the Northern region fared better (49% average across indicators) (Table 48). Hospitals appeared to do somewhat better than their smaller counterparts (45% availability of guidelines across the indicators). Private facilities did somewhat better than public ones, and urban sites did comparatively better than their rural counterparts.

2.3.1.4 Data Quality Checks

Data quality checking is an important aspect of data quality assurance because errors are common, but easily prevented given sufficient vigilance. Figure 86 shows the results for the assessment of data quality checks at health facilities. A routine process for checking the quality of submitted reports was present at 36% of sampled facilities. Table 49 shows the results for data quality checks by relevant stratifiers. Hospitals were more likely to have such a process (73%) than CHCs (45%), CHPs (43%), or MCHPs (26%). Facilities in the Northern region were likewise more likely to have this process (49%) than facilities in the Southern (32%), Eastern (31%), or Western regions (17%).

Figure 86: Data quality and supervision



Routine accuracy checks (that is, recompilation of priority indicators by a supervisor for a given reporting period and comparison with reported values for the same period) are another practice that enhances data quality. Thirty-six percent (36%) of facilities in the DQR sample reported having such a practice at the facility (Fig. 86). Again, hospitals were more likely to have this practice (73%) than CHCs, CHPs, or MCHPs (40%, 29%, and 37%, respectively) (Table 49).

Consistency checks of summarized data (for example, the evaluation of trends) conducted routinely can also improve data quality by highlighting erroneous values in source documents and monthly reports. Thirty-five percent (35%) of sampled health facilities reported having such a system in place (Fig.86).

Routine checking of completeness and timely filling of source documents is another good practice to help improve data quality. Of the health facilities in the sample, 52% reported having this practice at the facility (Fig. 86). Hospitals (82%) were more likely than other types of facilities (48% to 62%) to report that they conducted this type of data quality checking (Table 49).

Table 49: Percentage of facilities that reported health data to a MOHS reporting system with tracer items for data management, by facility type, managing authority, and milieu (N=142) - Data quality checks

Data Quality Checks	Routine process for checking quality of reports	Accuracy check was routinely conducted	Consistency checks of summarized data routinely conducted	Checks for timely entry and completeness routinely conducted	Total number of facilities
Region					
Western	17%	27%	24%	36%	19
Eastern	31%	44%	44%	58%	31
Southern	32%	25%	25%	39%	45
Northern	49%	44%	44%	65%	47
Facility type					
Hospital	73%	73%	64%	82%	11
CHC	45%	40%	38%	62%	42
CHP	43%	29%	29%	49%	35
MCHP	26%	37%	37%	48%	54
Managing authority					
Government/ Public	37%	37%	37%	52%	135
Private	11%	11%	6%	39%	7
Urban/Rural					
Urban	21%	27%	31e%	46%	30
Rural	39%	38%	36%	53%	112
Total	36%	36%	35%	52%	142

2.3.1.5 Documentation, Policies, and Supervision

Health facilities should maintain records of data quality control efforts so that they can track progress toward goals and objectives for improving data quality. Table 50 shows the results of DQR questions assessing whether written documentation of data quality control measures existed and whether written policies were in place to guide data quality checks. Only 21% of sampled sites reported having written documentation of the results of data quality checks, and only 13% of sites said that they had written policies to guide data quality control.

Table 50: Percentage of facilities that reported health data to a MOHS reporting system with tracer items for data management, by facility type, managing authority, and milieu (N=142) - Documentation, policies, and supervision

Documentation, Policies, and Supervision	Written documentation of the results of data quality controls	Written policy on how to conduct data quality checks	Facility received regular supervisory visits	Documented supervisory visit in past 6 months	Total number of facilities
Region					
Western	17%	17%	65%	77%	19
Eastern	28%	20%	76%	72%	31
Southern	30%	11%	61%	84%	45
Northern	11%	10%	72%	80%	47
Facility type					
Hospital	27%	18%	73%	82%	11
CHC	21%	17%	79%	81%	42
CHP	26%	14%	77%	77%	35
MCHP	19%	11%	59%	80%	54
Managing authority					
Government/Public	21%	13%	68%	79%	135
Private	21%	21%	80%	80%	7
Urban/Rural					
Urban	33%	18%	64%	70%	30
Rural	19%	12%	69%	81%	112
Total	21%	13%	68%	79%	142

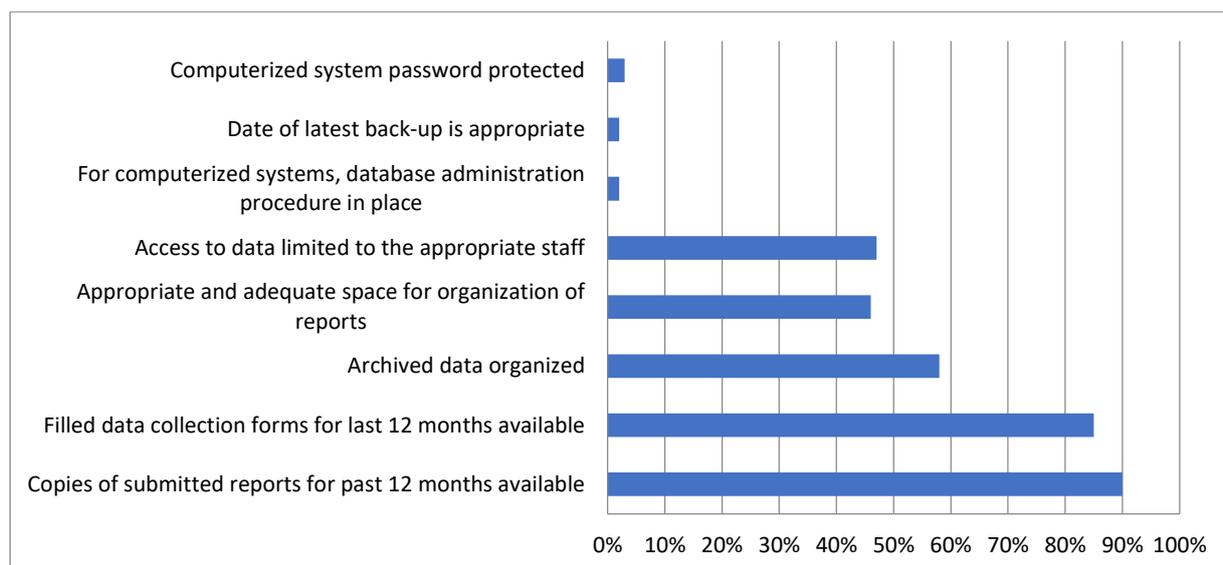
Supervision is very important for data quality control. Staff are far more likely to make the extra effort to ensure data quality if they know that a supervisor will be checking the data. Sixty-eight percent (68%) of the health facilities reported receiving regular supervisory visits; this good result was seen throughout the regions, facility types, management authorities, and milieu. Moreover, 79% of health facilities reported having had a supervisory visit in the past six months.

2.3.1.6 Data Maintenance and Confidentiality

Maintaining an archive of historical data is also important for data quality control. In an era of increased concern for data quality, historical data are essential for assessing the accuracy of data and making comparisons to the past to gauge current performance. If historical data are not available, such comparisons cannot be made.

Ninety percent (90%) of sampled sites reported having copies of submitted reports for the past 12 months available on site (Fig. 87, Table 51), whereas 85% had completed data collection forms available for 12 months. However, for only 58% of sites were these archived data judged to be “organized” such that they were easily retrievable (for example, by service and date). Only 46% reported having appropriate (for example, clean, dry) and adequate (for example, sufficient size) storage space available for archiving historical data.

Figure 87: Data maintenance



Limiting access to the data archive helps ensure appropriate maintenance of the archive. Only 47% of sampled sites reported limiting access to the appropriate staff (Fig. 87). Respecting the confidentiality of clients is important for maintaining the integrity of service delivery and ensuring good client/facility relations. Only 54% of sampled health facilities reported maintaining relevant personal client data according to national or international confidentiality guidelines (Table 51).

This section of the DQR also had questions pertaining to data security for when data were entered into a computer. Fewer than 5% of health facilities in the sample had computerized systems and the survey was poorly designed as regards this issue. National level estimates are included in the list of sample estimates in Annex II (see questions SAF_122, SAF_123, and SAF_124); they are not presented here.

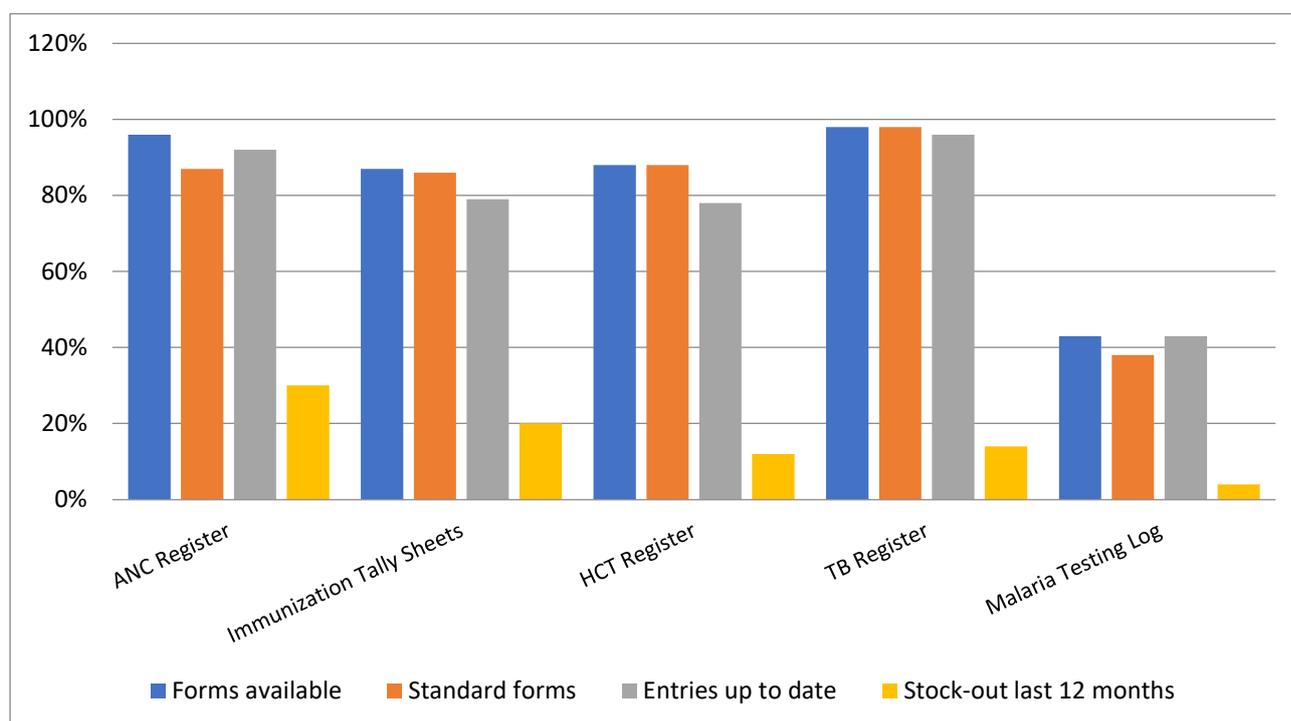
Table 51: Percentage of facilities that reported health data to a MOHS reporting system with tracer items for data management, by facility type, managing authority, and milieu (N=142) - Data maintenance and confidentiality

Data Maintenance	Copies of submitted reports for past 12 months available	Filled data collection forms for last 12 months available	Archived data organized	Appropriate and adequate space for organization of reports	Access to data limited to the appropriate staff	Personal data maintained according to confidentiality guidelines	Total number of facilities
Region							
Western	93%	98%	75%	52%	40%	44%	19
Eastern	100%	86%	60%	44%	38%	44%	31
Southern	96%	76%	60%	51%	68%	54%	45
Northern	78%	86%	50%	41%	37%	66%	47

Facility type							
Hospital	91%	73%	82%	64%	73%	73%	11
CHC	88%	88%	60%	55%	52%	60%	42
CHP	91%	86%	66%	51%	43%	60%	35
MCHP	91%	83%	52%	39%	46%	48%	54
Managing authority							
Government/Public	91%	84%	57%	46%	48%	55%	135
Private	74%	89%	94%	59%	31%	37%	7
Urban/Rural							
Urban	89%	88%	67%	51%	40%	39%	30
Rural	91%	84%	56%	45%	49%	58%	112
Total	90%	85%	58%	46%	47%	54%	142

2.3.1.7 Adequacy of Source Documents

Figure 88: Adequacy of source documents for tracer Indicators



Source documents are where the results of service delivery are initially recorded. If data are entered in error in the source document, the error will continue to appear through the different levels of the health system. Therefore, it is imperative that data are first recorded as accurately as possible in the source documents. To help ensure accuracy, source documents should be well defined, standardized, and readily available (that is, no stockouts).

Figure 88 and Tables 52 to 56 present the results of the assessment of the adequacy of source documents. Each table in the series shows the results for a different programme area. The metrics assessed were whether the forms were available, standardized, up-to-date, and the occurrence of stockouts of forms/tools.

For the ANC register (Table 52), 96% of sampled sites were judged to have the ANC register available, and 87% of sites were using the standardized version of the register. Ninety-two percent (92%) had entries up to the current day, whereas only 30% of sites reported a stockout of the register in the past 12 months. Hospitals (50%) were less likely than CHCs (80%), CHPs (88%), and MCHPs (91%) to be using a standardized ANC register. Hospitals were also more likely to have had a stockout in the past 12 months (50% of sites).

Table 52: Adequacy of source documents, by region, facility type, managing authority, and milieu - ANC register

Adequacy of Source Documents – ANC Register	ANC register-forms available	ANC register-standardized tools/forms	ANC register-entries up to the current day	ANC register-stockout in last 12 months	Total number of facilities
Region					
Western	89%	77%	86%	13%	19
Eastern	100%	100%	94%	28%	31
Southern	94%	82%	88%	26%	45
Northern	96%	88%	95%	41%	47
Facility type					
Hospital	88%	50%	75%	50%	11
CHC	93%	80%	80%	32%	42
CHP	94%	88%	94%	24%	35
MCHP	98%	91%	94%	31%	54
Managing authority					
Government/Public	96%	87%	91%	29%	135
Private	93%	86%	93%	43%	7
Urban/Rural					
Urban	95%	77%	88%	28%	30
Rural	96%	89%	92%	30%	112
Total	96%	87%	92%	30%	142

Table 53 shows the results for the immunization tally sheets. Eight-seven percent (87%) of sites reported having tally sheets available. Eighty-six percent (86%) were using the standardized tally sheets. Seventy-nine percent (79%) of sites had entries in the tally sheets up to the current day. Only 20% had experienced a stockout in the past year. Again, hospitals (71%) were less likely than their smaller counterparts (85% to 88%) to be using standardized tally sheets. The large disparity between public (81%) and private (23%) sites on the question, entries up to the current day, was likely an artefact due to the small number of private sites in the sample (n=7).

Table 53: Adequacy of source documents - Immunization tally sheets

Adequacy of Source Documents – Immunization Tally Sheets	Immunization tally sheets-forms available	Immunization tally sheets-standardized tools/forms	Immunization tally sheets-entries up to the current day	Immunization tally sheets-stockout in last 12 months	Total number of facilities
Region					
Western	88%	76%	76%	34%	19
Eastern	81%	81%	75%	19%	31
Southern	83%	83%	78%	4%	45
Northern	94%	94%	84%	32%	47
Facility type					
Hospital	86%	71%	86%	14%	11
CHC	88%	88%	73%	17%	42
CHP	87%	87%	84%	13%	35
MCHP	87%	85%	78%	26%	54
Managing authority					
Government/Public	88%	88%	81%	19%	135
Private	69%	46%	23%	46%	7
Urban/Rural					
Urban	76%	69%	61%	16%	30
Rural	89%	89%	83%	21%	112
Total	87%	86%	79%	20%	142

The results for the adequacy of the HCT register are given in Table 54. Eighty-eight percent (88%) of sites had the HCT register available, and 88% were also found to be using the standardized form of the register. Seventy-eight percent (78%) had entries up to the current day, and only 12% had experienced a stockout in the past year. MCHPs were less likely to have the HCT register available (75%), to be using a standardized form (75%), and to have entries up to the current day (69%) than the other types of facilities, but oddly, they were also less likely to be stocked out in the past year (0%). The Eastern region fared less well than the other regions for these metrics.

Table 54: Adequacy of source documents - HCT register

Adequacy of Source Documents – HCT Register	HCT register-forms available	HCT register-standard or improvised materials	HCT register-entries up to the current day	HCT register-stockout in last 12 months	Total number of facilities
Region					
Western	90%	90%	90%	16%	19
Eastern	67%	67%	58%	6%	31
Southern	93%	93%	78%	12%	45
Northern	100%	100%	90%	14%	47
Facility type					
Hospital	100%	100%	100%	20%	11
CHC	98%	98%	88%	25%	42
CHP	90%	90%	76%	10%	35
MCHP	75%	75%	69%	0%	54
Managing authority					
Government/Public	87%	87%	77%	10%	135
Private	100%	100%	100%	32%	7
Urban/Rural					
Urban	85%	85%	75%	21%	30
Rural	89%	89%	79%	9%	112
Total	88%	88%	78%	12%	142

M&E of TB services are highly standardized and typically well supported in many countries. TB has highly standardized data management, which has remained consistent over many years. TB often scores well on M&E assessments because of these factors. The results of the assessment of the adequacy of source documents for the TB register bears this out; all metrics scored in the high 90s, and only 14% of facilities experienced stockouts of the register in the past 12 months (Table 55).

Table 55: Adequacy of source documents - TB register

Adequacy of Source Documents – TB Register	TB register-forms available	TB register-standard or improvised materials	TB register-entries up to the current day	TB register-stockout in last 12 months	Total number of facilities
Region					
Western	100%	100%	100%	38%	19
Eastern	89%	89%	89%	11%	31
Southern	100%	100%	100%	22%	45
Northern	100%	100%	95%	5%	47
Facility type					
Hospital	100%	100%	100%	11%	11
CHC	97%	97%	94%	17%	42
CHP	100%	100%	100%	0%	35
MCHP*	-	-	-	-	54
Managing authority					
Government/Public	98%	98%	96%	14%	135
Private	100%	100%	100%	0%	7
Urban/Rural					
Urban	91%	91%	82%	15%	30
Rural	100%	100%	100%	13%	112
Total	98%	98%	96%	14%	142

*MCHPs do not provide TB services.

M&E of malaria services are less well established, with increased donor funding and national control programmes for malaria only coming into being in the past decade or so. This was evident in the results of the assessment for the adequacy of the Malaria Diagnostic and Testing Register (Table 56). Forty-three percent (43%) of sites reported having the register available, 38% were using the standard form of the register, and 43% had entries up to the current day. However, only 4% of sites experienced stockouts of the malaria register.

Large disparities are evident in the adequacy of the Malaria Diagnostic and Testing Register among the regions and facility types. Sixty-one percent (61%) of sites in the Northern region had the register available, whereas only 24% did in the Western region. Similarly, 73% of hospitals had the register available, whereas only 32% of CHPs did. Seventy-three percent (73%) of hospitals had standardized registers, but only 29% of CHPs did. Likewise, 73% of hospitals had entries up to the current day, whereas only 32% of CHPs did.

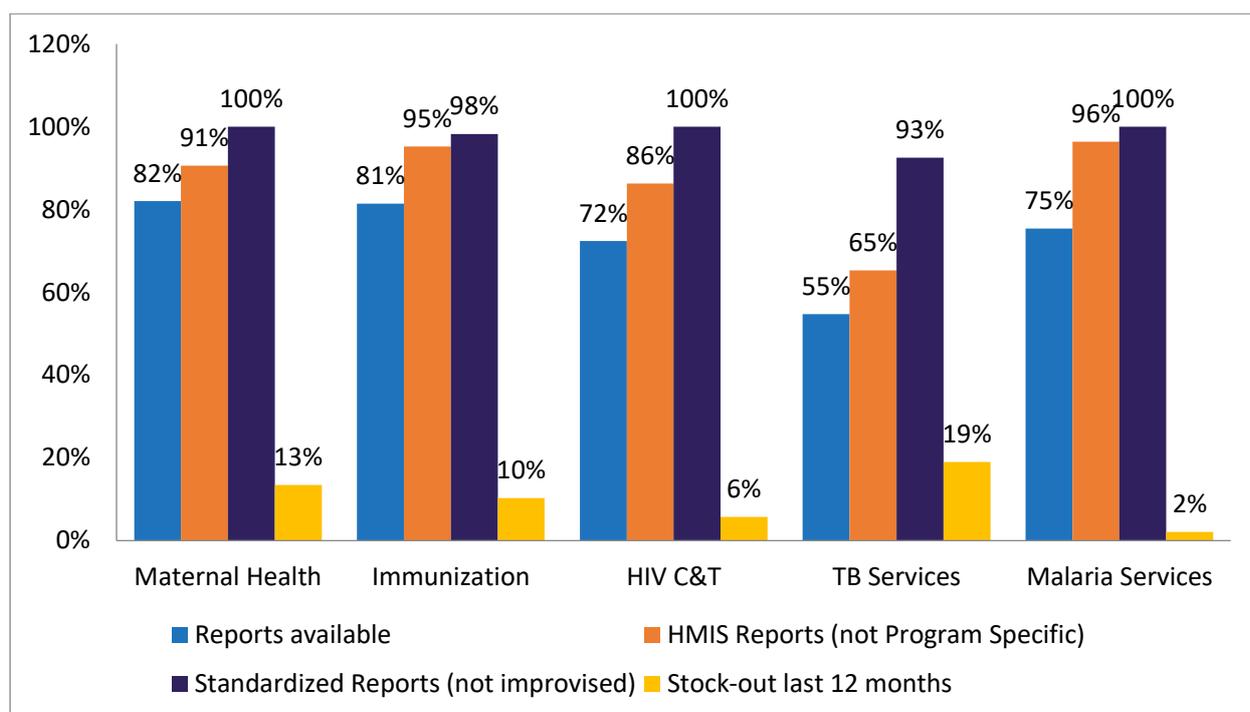
Table 56: Adequacy of source documents - Malaria Diagnostic and Testing Register

Adequacy of Source Documents – Malaria Diagnostic and Testing Register	Malaria diagnostic and testing register-forms available	Malaria diagnostic and testing register - standard or improvised materials	Malaria diagnostic and testing register-entries up to the current day	Malaria diagnostic and testing register-stockout in last 12 months	Total number of facilities
Region					
Western	24%	24%	24%	3%	19
Eastern	50%	50%	50%	2%	31
Southern	29%	16%	29%	0%	45
Northern	61%	58%	60%	9%	47
Facility type					
Hospital	73%	73%	73%	0%	11
CHC	55%	48%	52%	7%	42
CHP	32%	29%	32%	0%	35
MCHP	44%	39%	44%	6%	54
Managing authority					
Government/Public	44%	39%	43%	4%	135
Private	33%	33%	33%	0%	7
Urban/Rural					
Urban	38%	38%	36%	2%	30
Rural	44%	38%	44%	4%	112
Total	43%	38%	43%	4%	142

2.3.1.8 Adequacy of Reporting Tools/Forms

The assessment of the adequacy of reporting forms/tools suffered from a large amount of missing data. It is likely that the data collection tool on the adequacy of reporting forms in the system assessment component of the DQR was confusing because it tried to account for programme-specific and integrated reporting of service delivery. The subsequent version of the tool is simpler and easier to use. The results for the data collected are presented in Figure 89 and in Table 59: National Level Survey Estimates (in Annex II).

Figure 89: Adequacy of reporting forms, by programme area



One notable finding for the adequacy of reporting forms comes from TB reporting. Whereas TB scored well on the adequacy of data collection tools, the availability of the TB reporting form was measured at only 55% at sampled sites. Moreover, only 65% of sites reported using the HMIS form to report TB results (the rest reported using programme-specific tools). TB is often reported in parallel to the HMIS, but in an era of integration of public health reporting systems, this result is surprising.

2.3.2 District Level

The systems assessment was also conducted at the DHMT office for each district in the country. However, results are only available from nine districts. The results for the nine districts are presented in Table 57.

Only 62.5% of district staff had received appropriate training on reporting (Table 57). Sixty-two percent (62%) of districts used standard indicator definitions (all indicators, except Penta3 - 100%). Indicators measuring the availability of written guidelines on reporting at the district level fared poorly (12.5% for “how reports are to be submitted”), which is odd considering that all, but one district reported using the DHIS 2 to report programme results.

Only 37.5% of districts reported having sufficient copies of blank data collection and reporting forms to distribute to health facilities in the district.

Most districts scored well on data quality and supervision, and on the use of data for decision making. However, only 42.9% of districts reported having adequate storage space for archived results.

Table 57: District system assessment - Survey estimates (N=9)

System Assessment Domain and Indicator		Valid
System structure and function		
DVD_200	Responsibility for reporting clearly assigned to staff	100.0
DVD_201	Staff responsible for reporting has received training	62.5
DVD_202	Designated staff for reviewing data quality	75.0
DVD_203	Designated staff for reviewing aggregated numbers	75.0
DVD_204	Data received from facilities recorded in a standard tool without delay	87.5
Indicator definitions and reporting guidelines		
DVD_205_001	Number of ANC1 visits- standard indicator definition	62.5
DVD_205_002	Number of Penta3 - standard indicator definition	100.0
DVD_205_003	Number of HCT- standard indicator definition	62.5
DVD_205_004	TB cases notified- standard indicator definition	62.5
DVD_205_005	Suspect malaria cases - standard indicator definition	62.5
DVD_206_001	What they are supposed to report on	37.5
DVD_206_002	How reports are to be submitted	12.5
DVD_206_003	To whom reports should be submitted	100.0
DVD_206_004	When the reports are due	25.0
Data collection tools and reporting forms		
DVD_207	Source documents and reporting forms specified by the HMIS directorate are consistently used	100.0
DVD_208	Clear instructions have been provided to facilities on how to complete forms	87.5
DVD_209	Sufficient copies of blank forms are available to meet the needs of all facilities	37.5
Data quality and supervision		
DVD_210	District monitors timeliness and completeness of reporting from facilities	100.0
DVD_211	Written feedback is provided to facilities on quality of reporting	50.0
DVD_212	Routine process in the district for checking data quality at facilities	75.0
DVD_213	Accuracy checks are routinely conducted in facilities	100.0
DVD_214	Consistency checks of summarized data routinely conducted	62.5
DVD_215	Written policy at the district level on when and how to conduct data quality	50.0
DVD_216	District conducts regular supervisory visits to facilities	62.5
DVD_217	Staff from district visited each facility at least once in past 12 months	100.0
DVD_218	Written documentation on the result of supervisory visits to facilities	100.0
DVD_219	District receives regular supervisory visits from region/national level	100.0
DVD_220	Supervisory visit conducted in last 6 months	100.0
Data maintenance and confidentiality		
DVD_221	Copies of monthly reports submitted by the district available for the past 12	100.0
DVD_222	Archived monthly reports from facilities submitted to the district available for the past 12 months	85.7
DVD_223	Archived data organized and records easily retrievable	85.7
DVD_224	Appropriate and adequate space for secure organization and storage of reports	42.9
DVD_225	For computerized systems, there is a clearly documented and implemented database administration procedure	71.4
DVD_226	Latest date of back-up is appropriate	71.4
DVD_227	Computerized system password protected	100.0
Demographic information		
DVD_228	District has target population for priority indicators	85.7
DVD_229	Map of district showing facilities and services offered	42.9
DVD_230	District has data on number of births and deaths	85.7
Data Use		
DVD_231	District monitors for priority indicators	100.0
DVD_232	District tracks progress toward targets for priority indicators	85.7
DVD_233	Assigned staff to interpret data	85.7
DVD_234	Programmatic decisions based on analysed data	71.4
DVD_235	Mechanism by which district can obtain support for data analysis	85.7

3.0 Desk Review

The Desk Review is an analysis of previously reported aggregate data for priority indicators in the HMIS (that is, the DHIS 2). The analysis seeks to evaluate the data for consistency, completeness, and the presence of anomalous values (that is, outliers). The Desk Review can be performed on a pre-configured “app” from WHO in the DHIS 2 or using a standardized Excel workbook with built-in automation. The DQR app for the DHIS 2 requires installation and extensive configuration to produce the required output. To use the Excel tool, data must be extracted from the DHIS 2 and copied/pasted into the tool. Both mechanisms are problematic, especially if the analysis is conducted remotely. During the report writing period for the Sierra Leone SARA+, the DHIS 2 was offline for extensive periods, and when accessible, it had bugs that prevented the complete analysis suggested by the standard Desk Review format. However, data were largely available for download and population in the Excel version of the tool. The elements of the Desk Review that could be conducted were Domain 2, Internal Consistency of Reported Data, which includes the analysis of outliers, consistency over time, and consistency between related indicators. From Domain 1, Completeness of Reporting, the only aspect available was the Completeness of Indicator Reporting – Presence of missing and zero values. Domains 3 and 4, which address external comparisons (for example, comparison of routine data with analogous survey values), and the assessment of population data values, respectively, could not be addressed with the available data.

3.1 Domain 1 – Completeness of Reported Data

As noted above, because of technical problems with the DQR app in the DHIS 2 in Sierra Leone, the completeness and timeliness of reporting could not be assessed for all tracer indicators selected for the DQR. Only ANC 1st visit could be assessed (Figs. 90 and 91).

Figure 90: Completeness and timeliness of reporting 2016 - ANC 1st Visit

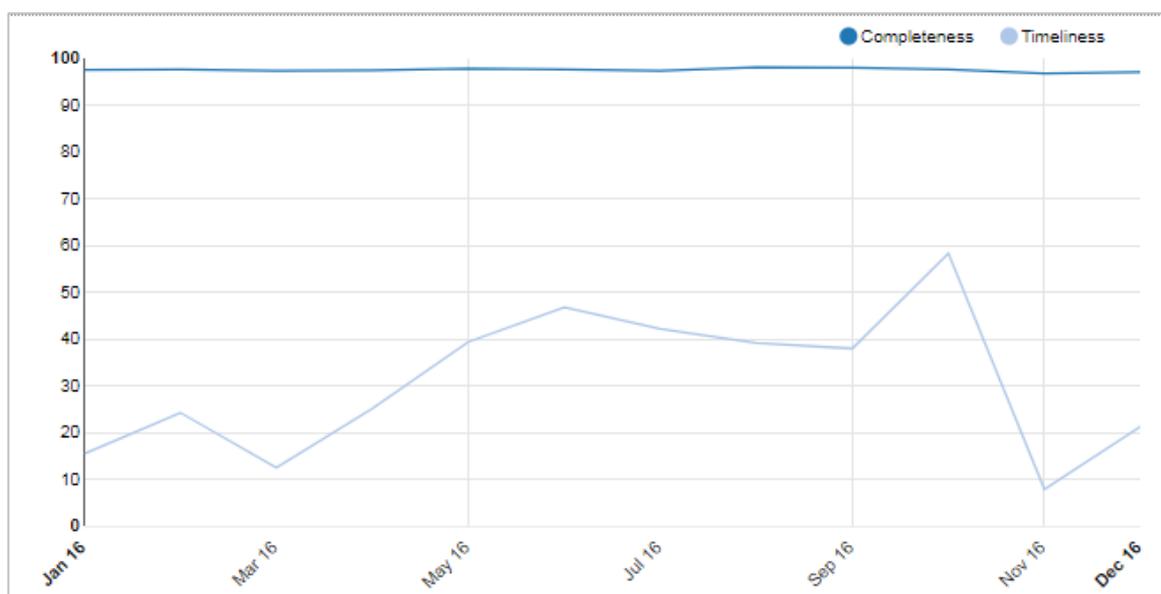
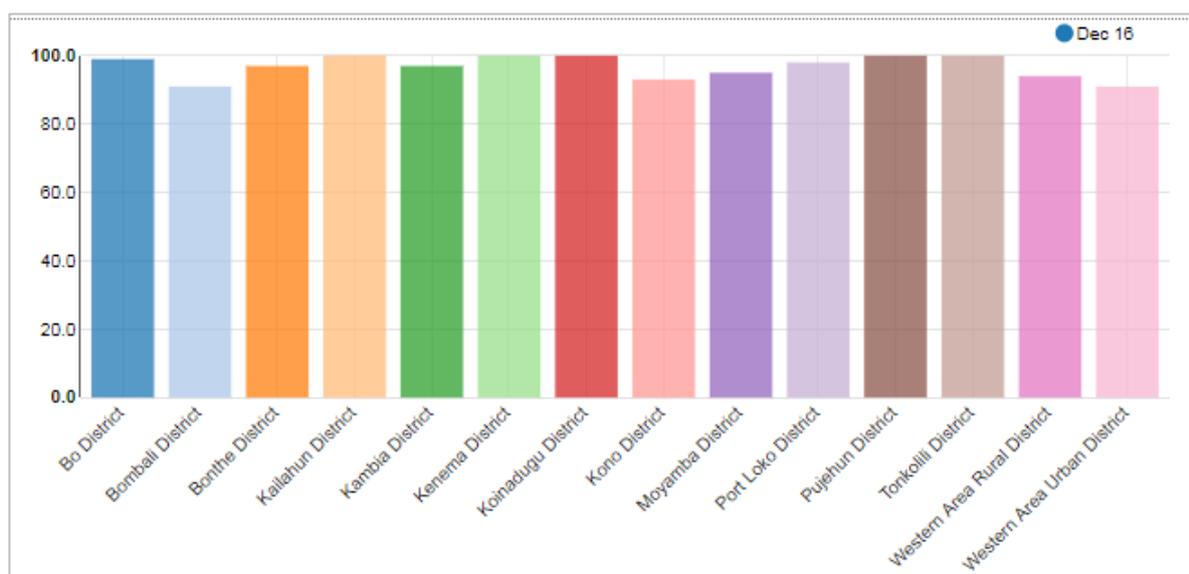


Figure 91: Completeness of reporting for ANC 1st Visit, by district 2016



3.1.1 Completeness and timeliness of facility reporting

Completeness was very high for the indicator for the period January 2016 to December 2016 (Figs. 90 and 91). The overall completeness rate for the national level was 97.7%, and no district surpassed the 10% threshold for quality (i.e., was more than 10% different from the pre-defined standard of 90%). However, timeliness of reporting (submission of monthly reports by the reporting deadline) was measured at only 31%, with all districts (14) failing to meet a modest standard of 75% of monthly reports submitted by the deadline (Fig. 90).

3.1.2 Completeness of indicator data

Completeness of indicator data measures the extent to which data that are expected to be reported on the monthly report appear in the appropriate cells in the monthly report. For ANC 1st visit, the data element completeness was very good at 96.7%. Only Western urban district failed to meet the standard of 90% completeness (Fig. 91). The analysis could not consider health facility values in the calculation of data element completeness because it was conducted in the DHIS 2 app. The app was not available for subsequent analyses.

For TB, the tracer indicator, “Pulmonary TB Cases,” was used to assess the data element completeness. Two districts failed to reach the standard of 80% completeness for this indicator. Port Loko district was missing six months of data from 2016 in the DHIS 2 (April – September inclusive), and Bonthe district was missing three months of data (January, February and May) (data not shown). For TB, only district level values were available to judge completeness. If the district value is missing, this indicates that no health facility in the district submitted results for the missing months.

3.2 Domain 2 – Internal Consistency of Reported Data

3.2.1 Outliers

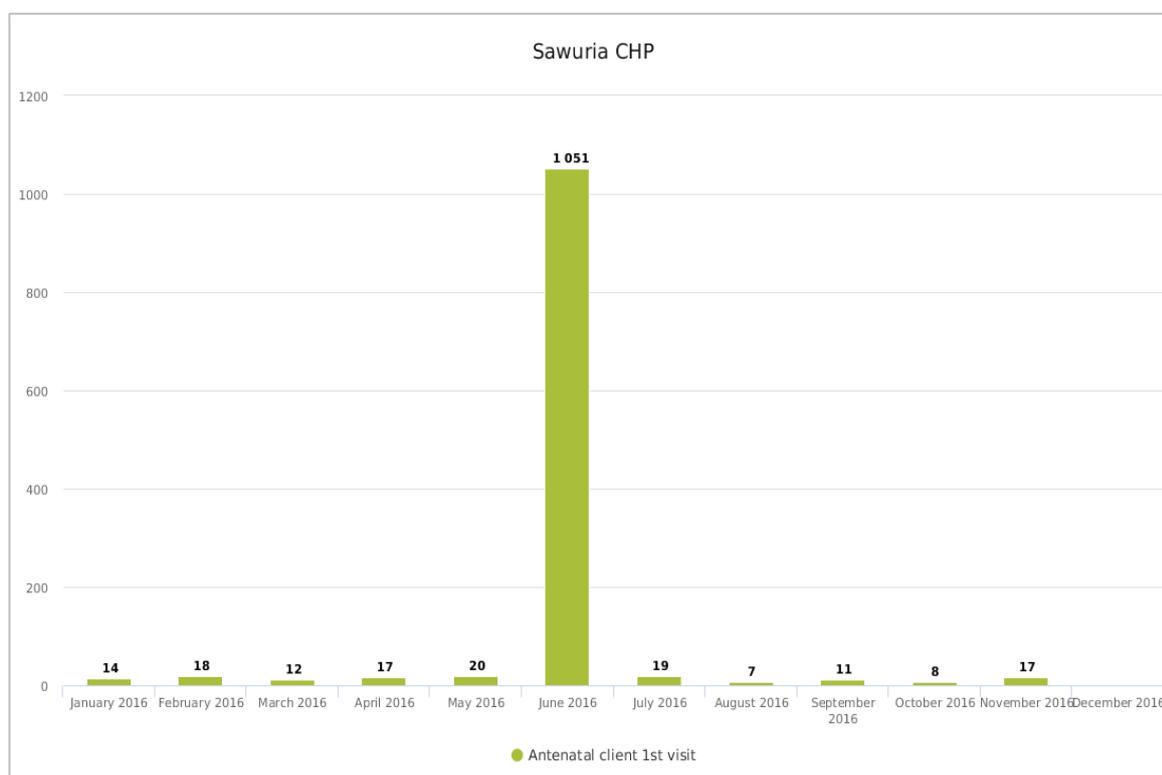
Outliers were examined by calculating the mean of monthly indicator values at the district level and determining whether monthly values were greater than three standard deviations from the

mean. Outliers are indicative of potential data quality problems; they can also arise from major changes in programme service delivery volume. Therefore, outliers that are identified should be investigated by programme managers with knowledge of service delivery patterns.

3.2.2 ANC 1st Visit

One extreme outlier was found on examination of the 12 monthly values for 2016 for ANC1. The value occurred in Koinadugu district. An investigation revealed a value for the district in June 2016 that was more than twice as large as any value reported by the district for the year.

Figure 92: ANC 1st visit monthly values, Sawuria CHP, Koinadugu District



Further investigation revealed a massive increase in the number of pregnant women receiving their ANC1 in Sawuria CHP in the month of June (Fig. 92). This value was probably a data quality problem that should be investigated by the Maternal Health Programme.

3.2.3 Malaria – Positive Malaria Tests

The malaria indicator, “Electronic Integrated Disease Surveillance and Response (EIDSR) – Malaria Tested Positive,” had one extreme outlier during the most recent previous complete year of data (October 2016 to September 2017). The outlier occurred in the month of May in Port Loko district. The value, 446,709, is approximately 40 times larger than the other monthly values in the series for Port Loko (Fig. 93).

Drilling down to Chiefdom level, Figure 94 reveals the chiefdom implicated in the dramatic increase in results for “Malaria Tested Positive” is the Koya Chiefdom. Figure 94 shows the results for health facilities for the month of May 2017 in Koya Chiefdom. Clearly, Makalie MCHP had an unusually large number of malaria cases testing positive for the month. This is a data

quality problem that should be addressed by malaria programme managers and DHIS 2 managers.

Figure 93: Distribution of “Malaria Tested Positive,” by Chiefdom - Port Loko District, May 2017 – DHIS 2

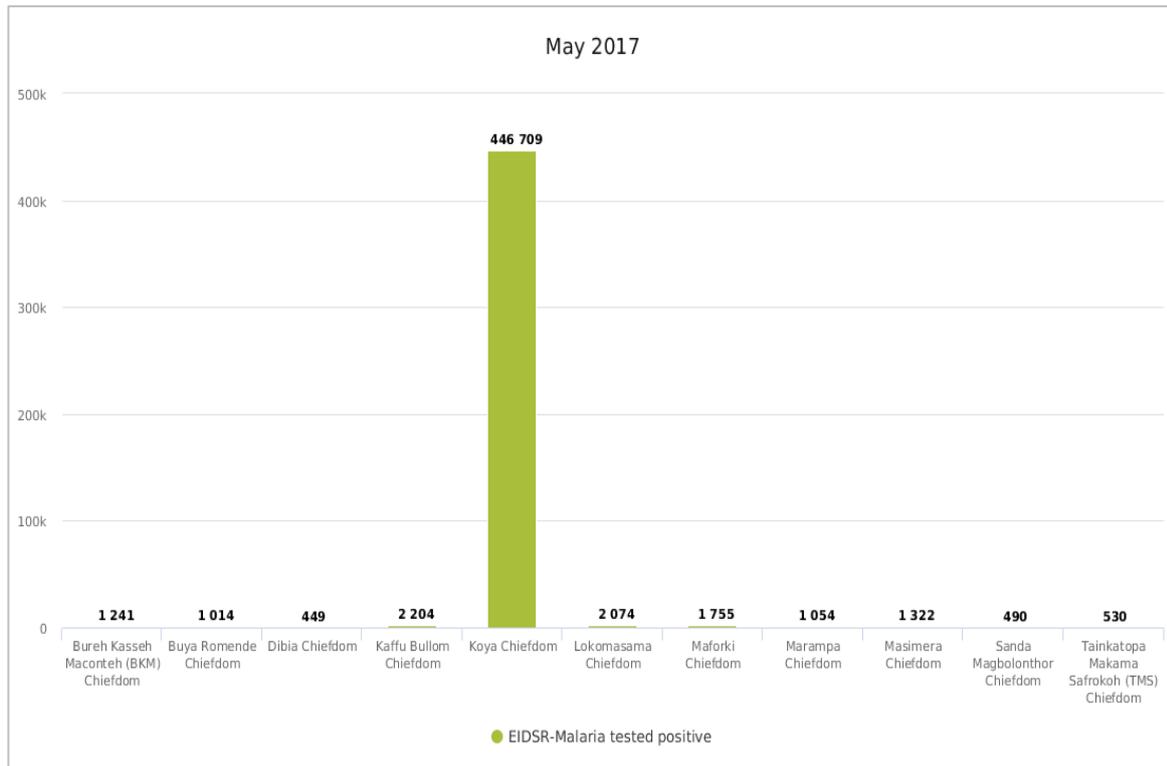
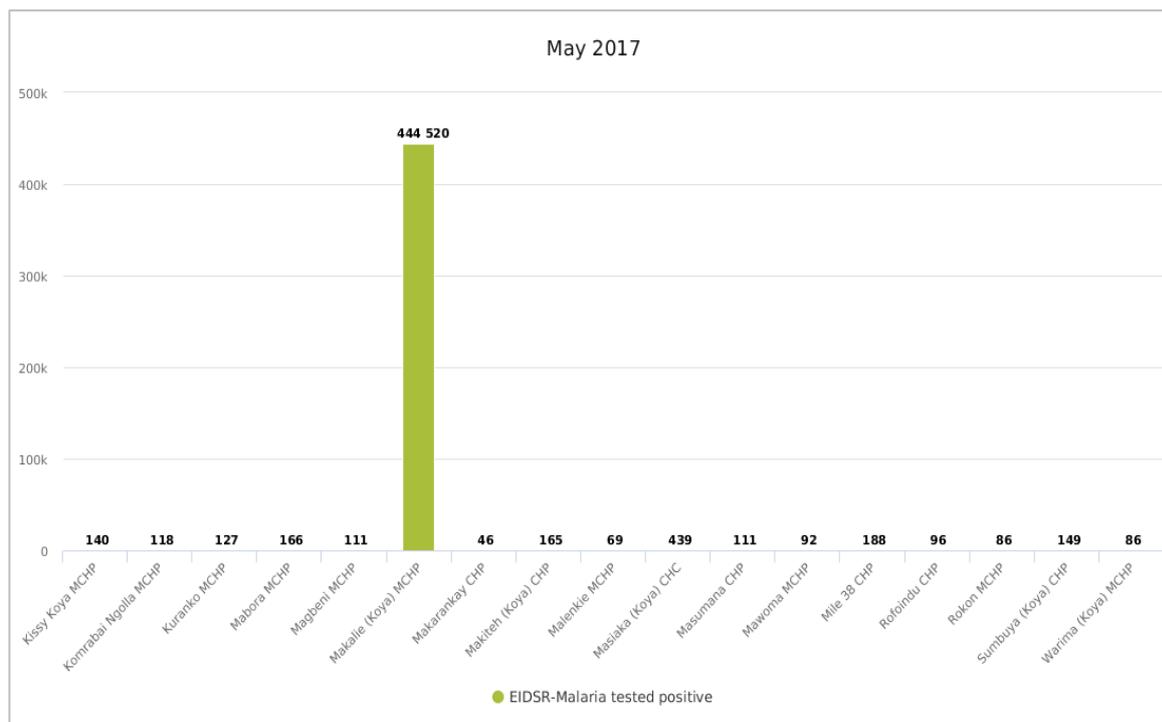


Figure 94: Distribution of “Malaria Tested Positive,” by health facility, Koya Chiefdom, Port Loko District, May 2017 – DHIS 2



3.2.4 HIV Counselling and Testing

The indicator, “Received results and post-test counselling,” was examined for outliers in the DHIS 2. The available results start from September 2016, which provides one year of reported results for analysis. Three monthly district values were flagged as greater than three standard deviations from the mean:

- Kenema district – December 2016
- Western urban district – November 2016
- Kono district – June 2017

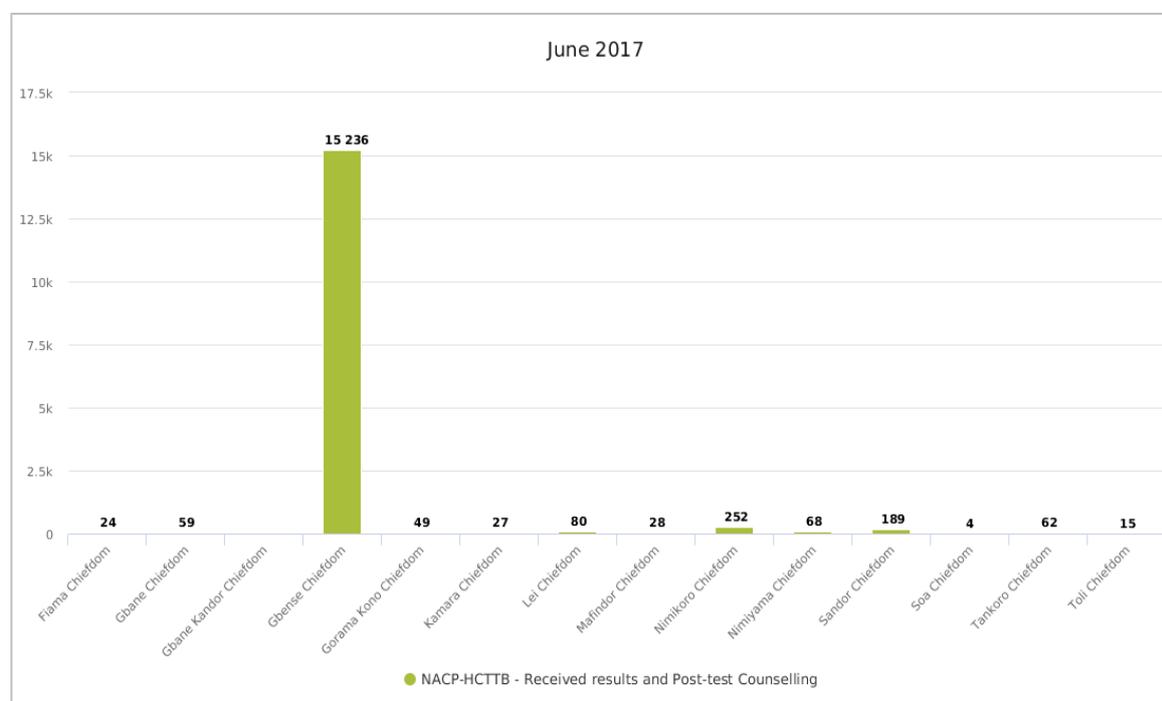
Table 58 shows the monthly district values for “Received results and post-test counselling.” Extreme outliers are shaded red. As can be seen in the table, the value for Kenema district in December 2016 was approximately four times larger than any of the other monthly values in the district for the period. In Western urban district, the value for November 2016 was roughly three times the other values in the series. In Kono district, the value for June 2017 was about eight times the other values for Kono district.

Table 58: Monthly district values for “Received results and post-test counselling,” from the DHIS 2, September 2016 - August 2017

No.	District	September	October	November	December	January	February	March	April	May	June	July	August
	Overall Total	28,199	30,034	66,908	52,870	25,882	41,647	39,165	29,022	30,314	43,334	28,095	30,833
1	Bo District	1,373	1,458	2,320	9,703	1,295	4,246	1,478	1,194	2,408	1,983	1,563	1,932
2	Bombali District	2,771	2,580	8,833	4,274	3,800	8,227	7,622	3,100	3,499	4,215	3,704	4,362
3	Bonthe District	710	726	806	601	793	803	499	539	660	728	707	811
4	Kailahun District	1,151	1,026	3,038	805	662	1,030	1,514	1,030	1,458	902	914	1,176
5	Kambia District	1,082	1,155	2,975	2,395	962	1,068	1,279	1,134	1,110	974	958	753
6	Kenema District	4,298	5,020	3,085	11,287	3,070	3,613	3,021	2,570	2,991	2,870	2,755	3,521
7	Koinadugu District	1,127	1,236	4,366	2,650	1,523	1,489	2,321	1,249	1,621	1,590	1,625	1,740
8	Kono District	1,845	2,049	1,798	1,686	1,762	1,798	2,852	2,136	1,642	16,093	2,080	1,748
9	Moyamba District	564	583	1,817	1,204	623	621	1,220	906	686	735	644	676
10	Port Loko District	2,867	2,564	7,116	3,804	1,949	3,984	5,062	2,494	2,677	2,706	2,519	2,376
11	Pujehun District	1,452	1,300	1,119	984	1,163	1,340	1,098	1,094	1,233	1,187	1,115	1,058
12	Tonkolili District	1,486	2,159	1,861	3,117	1,939	1,959	1,544	2,351	2,314	2,332	1,925	1,917
13	Western Area Rural District	1,430	2,048	5,007	3,247	1,798	2,967	2,293	1,879	1,785	1,506	1,681	1,848
14	Western Area Urban District	6,043	6,130	22,767	7,113	4,543	8,502	7,362	7,346	6,230	5,513	5,905	6,915

Kono district had the greatest discrepancy between the outlier and the other values in the series (that is, monthly indicator values for the year of analysis). Drilling down in Kono district for the month of June 2017, Figure 95 shows the results by Chiefdom.

Figure 95: Received results and post-test counselling, by Chiefdom, Kono District - June 2017 – DHIS 2

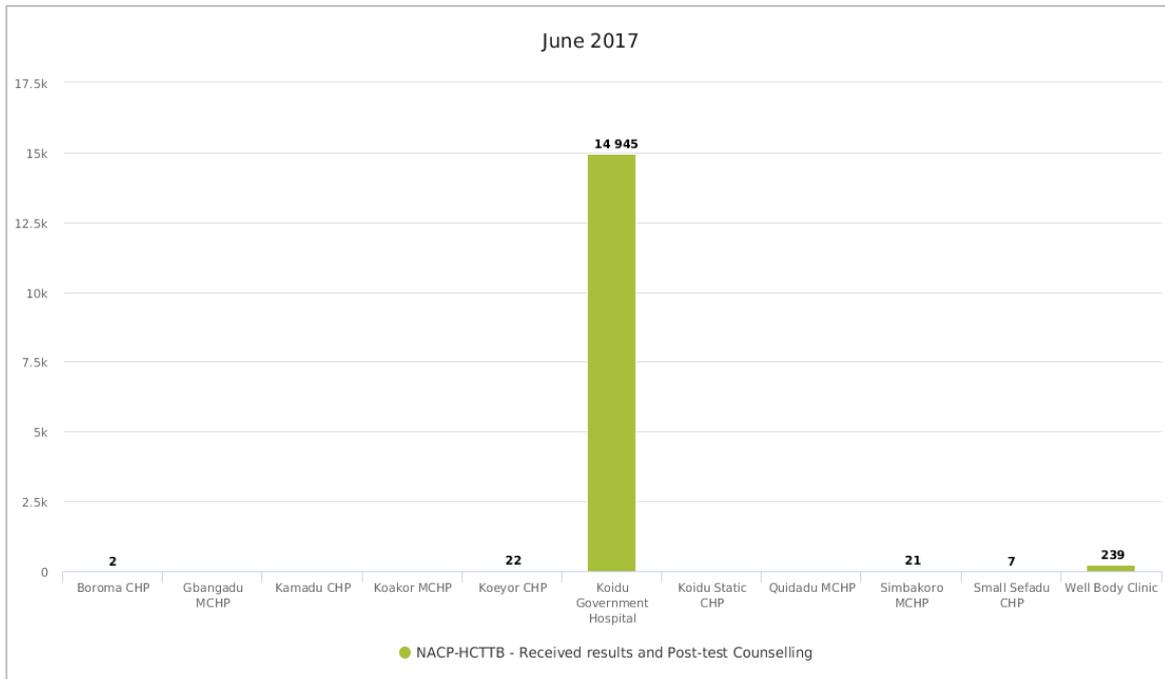


Clearly, Gbense Chiefdom had a tremendous disparity in the volume of clients receiving results and post-test counselling for the month of June 2017. Looking more closely at the results in the DHIS 2 permits the identification of the health facility implicated in these results.

Figure 96 shows the results by health facility for “Received results and post-test counselling” for the month of June 2017 in Gbense Chiefdom. Koidu Government Hospital reported 14,945 clients receiving results and post-test counselling for the month. Given that this is the district

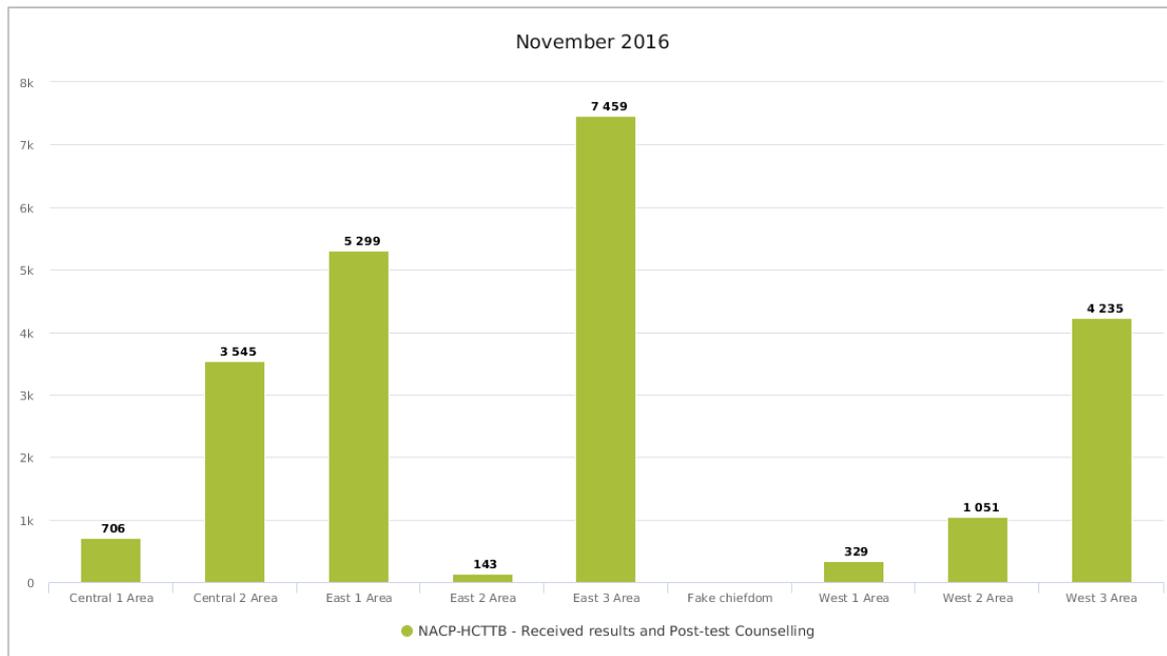
hospital, these results could be attributed to an intensification campaign; however, the volume suggests that this is unlikely. More probably, this result was due to a data entry error. Ultimately, an HIV/AIDS programme manager should review the results to make the determination.

Figure 96: Received results and post-test counselling, Gbense Chiefdom, Kono District, June 2017 – DHIS 2



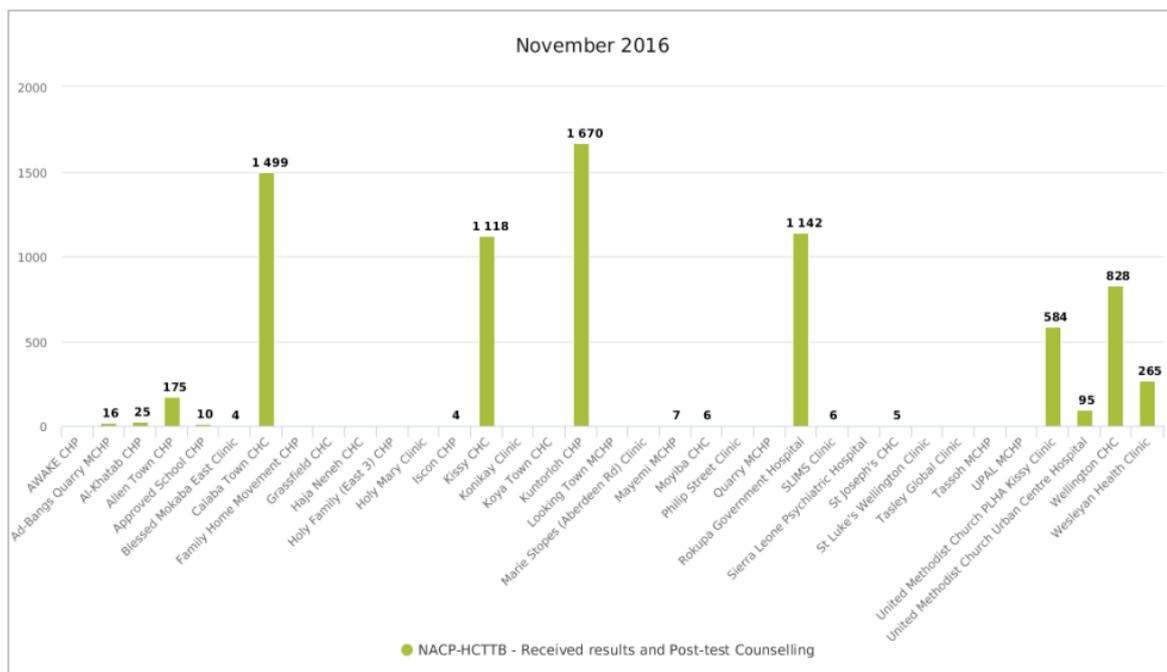
In the case of Western urban district, Figure 97 shows the distribution of results for the indicator by Chiefdom. Several Chiefdoms had large numbers of clients receiving results and post-test counselling, including East 3 Area, East 1 Area, West 3 Area, and Central 2 Area.

Figure 97: Distribution of clients “Receiving results and post-test counselling,” by Chiefdom, in Western urban district, November 2016, DHIS 2



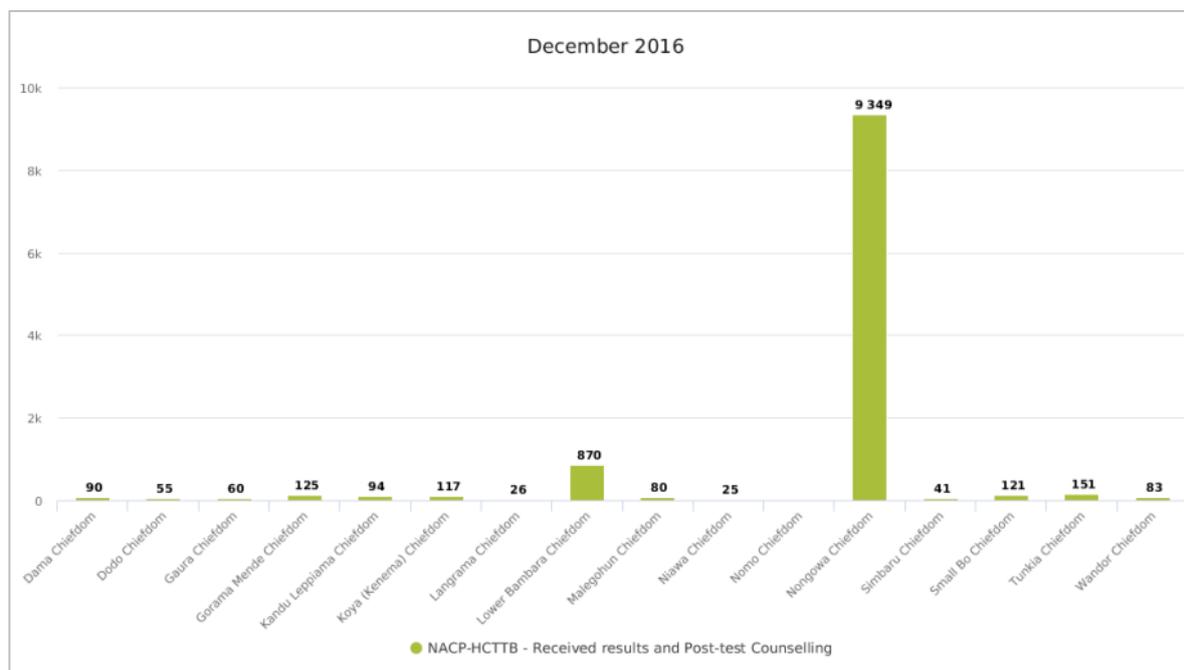
Drilling down further into East 3 Area Chiefdom, it is evident that several health facilities were contributing results to this monthly value, so this was not likely an outlier attributable to a data quality problem (Fig. 98). More likely, an intensification campaign took place during the month of November 2016. As suggested above, HIV programme managers should be consulted to verify the figures from Western urban district during this period.

Figure 98: Distribution of clients “Receiving results and post-test counselling,” by health facility in East 3 Area Chiefdom, Western urban district, November 2016 – DHIS 2



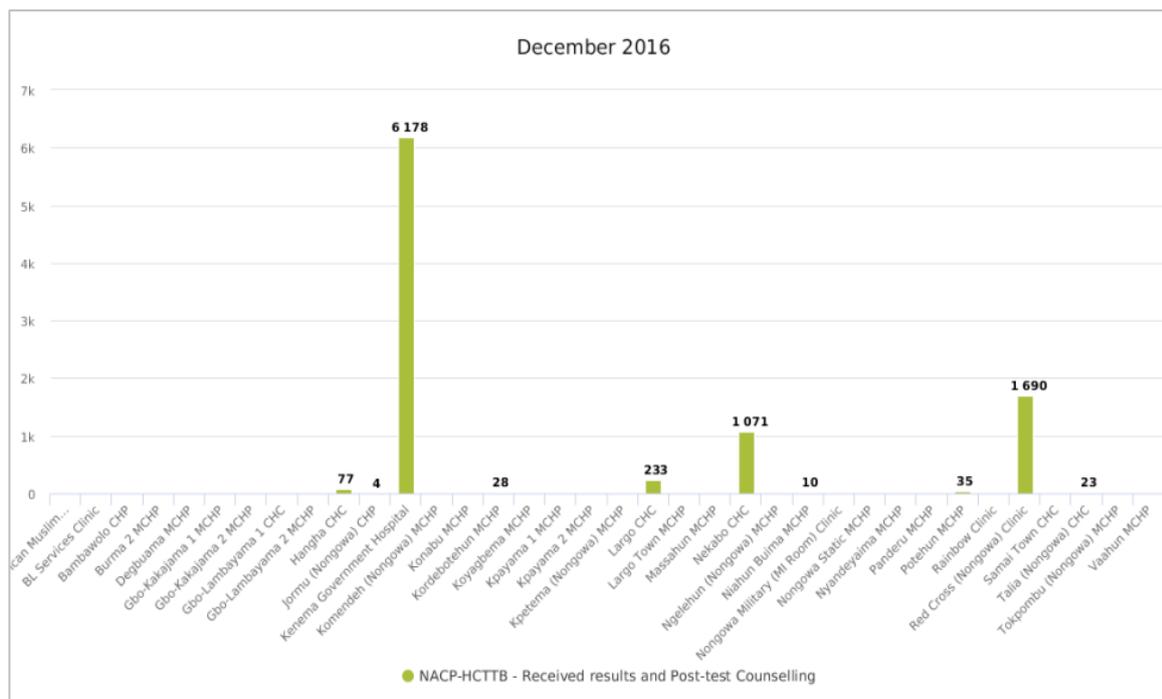
For Kenema district in the month of December 2016, drilling down to the Chiefdom level reveals the distribution of results found in Figure 99.

Figure 99: Received results and post-test counselling, by Chiefdom, Kenema District, December 2016 – DHIS 2



Nongowa Chiefdom had nearly 90% of the results for the district in the month of December 2016. A review of the results by health facility in Nongowa Chiefdom reveals a similar distribution of results as was found in Western Area the preceding month, that is, a large increase in service delivery for the indicator compared with other months in the series but distributed among several sites (Fig. 100).

Figure 100: Received results and post-test counselling, by health facility, Nongowa Chiefdom, Kenema District, December 2016 - DHIS 2



Although these results could signal a data quality problem, they could also be part of the same intensification campaign, localized in several focal health facilities, as was seen in the preceding month in Western urban district.

Oddly, the reported results in the DHIS 2 for “Received results and post-test counselling” and for “Clients tested” for the months of September, October, and November 2016 are *the same for all districts*. Although it is conceivable that all clients tested in the entire programme during these three months also received results and counselling, the finding is extremely unlikely and should be investigated by HIV programme managers.

3.2.5 Consistency Over Time

Reported results that are inconsistent over time can also indicate data quality problems. Results for priority indicators for the most recent complete year of reporting (2016) were compared with annual values reported to the DHIS 2 for up to three previous years. The current year (year of analysis, that is, 2016) was compared with the average value for the three preceding years for indicators with a constant trend, or to the value forecast from the slope of the trend for three preceding years for indicators with a non-constant trend. Not all data could be compared; only ANC1, Penta 3, and pulmonary TB cases had complete data for the four years in question.

ANC 1st Visit

Figure 101: Scatter plot - Consistency over time - ANC 1st Visit

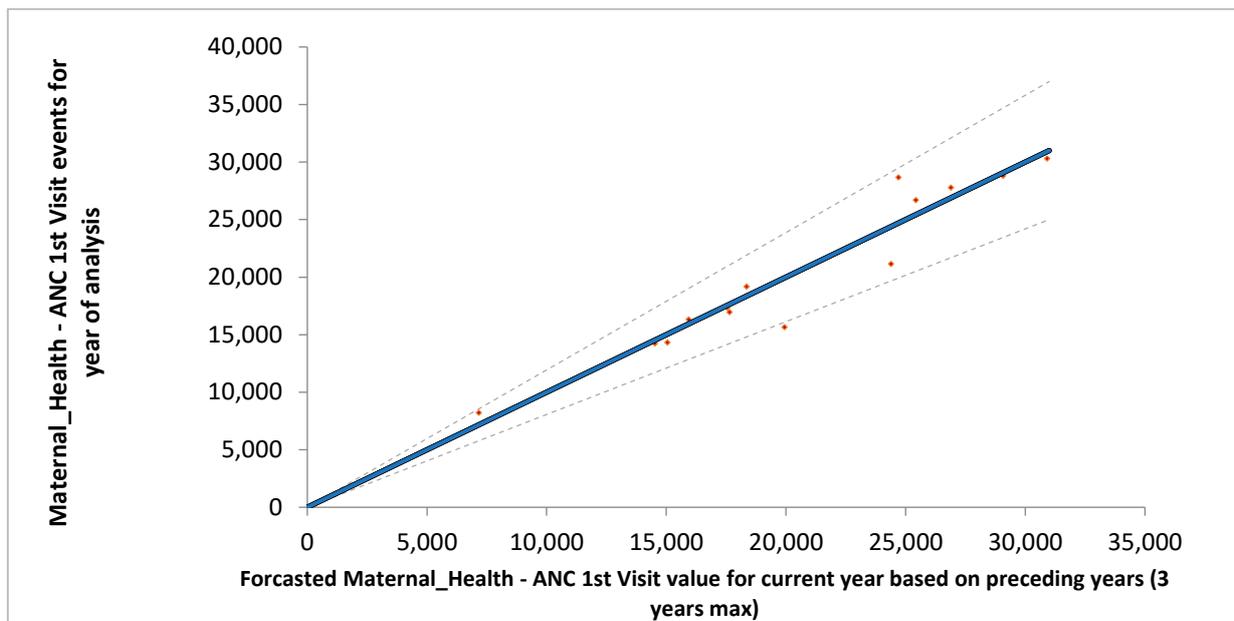
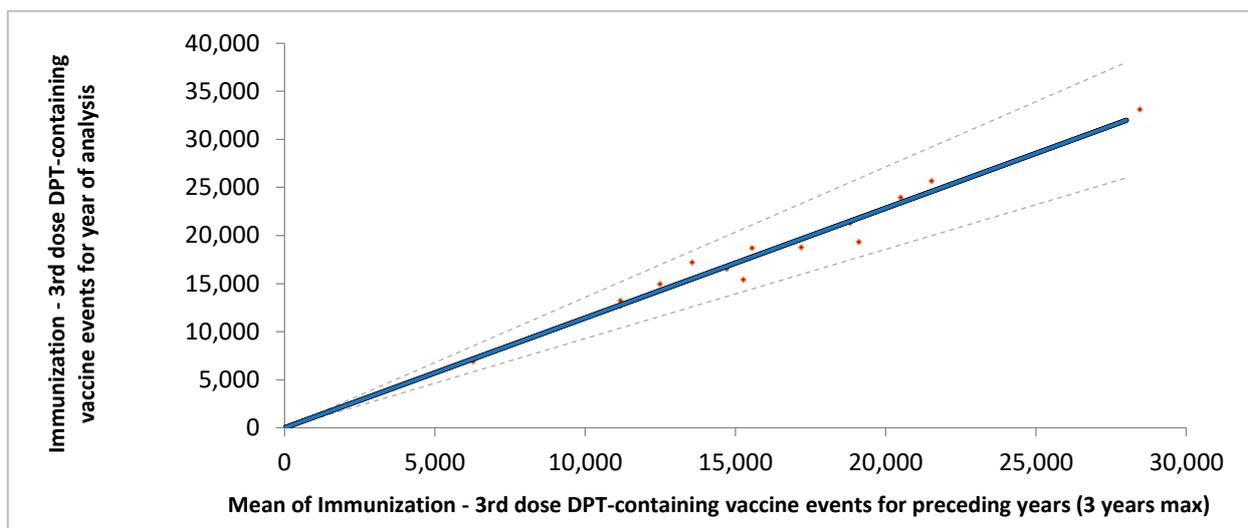


Figure 101 shows the scatter plot for ANC1 for the current year (2016) over the value forecast from the three previous years. Results that are consistent will have a ratio of 1.0. The dark line in the centre shows the national level aggregate results of the comparison, whereas the red dots are the district level ratios of the current year to the forecasted value. The grey dotted lines show the 20% margin of quality for the assessment. Red dots outside the grey lines indicate districts that failed to meet the quality standard for consistency over time for the indicator.

For ANC1, the national result is 99%, indicating that the national value (aggregated over all districts) was just slightly less than what was predicated by the results from the previous three years. Just one district (Kailahun district) had results in 2016 that were unexpected (that is, >20% lower) based on the trend from the previous three years. Otherwise, ANC1 appeared to be very consistent in reporting over time.

Immunization (Penta 3)

Figure 102: Scatter plot – Consistency over time - 3rd Dose Pentavalent Vaccine



Evaluation of the trend in reporting from 2013 to 2016 for the Penta 3 indicator revealed a constant trend. The value of Penta 3 for the year of analysis (2016) was compared with the average of the values for the three preceding years (2013 to 2015). The national level result was 114%, indicating a 14% increase in 2016 over the average of the three preceding years. All districts were within the 20% margin for quality. The immunization data for Penta 3 appeared to be very consistent over time (Fig. 102).

Pulmonary TB Cases

For TB, the scatter plot in Figure 103 shows the comparison between the value of the indicator for the year of analysis and the value forecast from the previous three years. The national ratio is 87%. Six district ratios are more than 20% different than the observed or national ratio (Bonthe, Kailahun, Kambia, Koinadugu, Port Loko, and Tonkolili districts).

Figure 103: Scatter plot - Consistency over time - Pulmonary TB cases

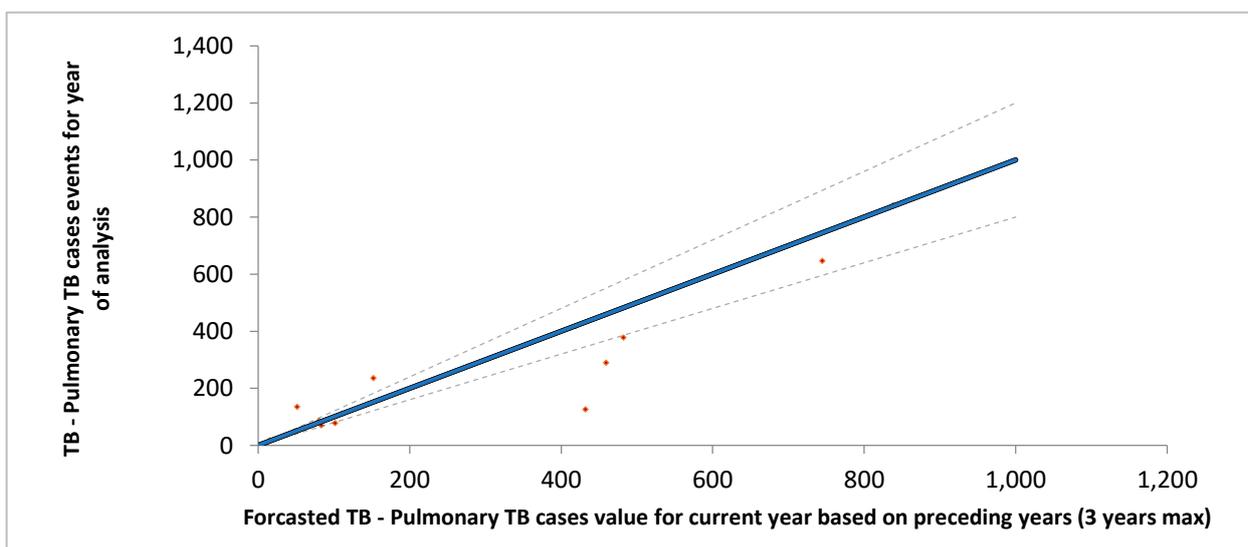
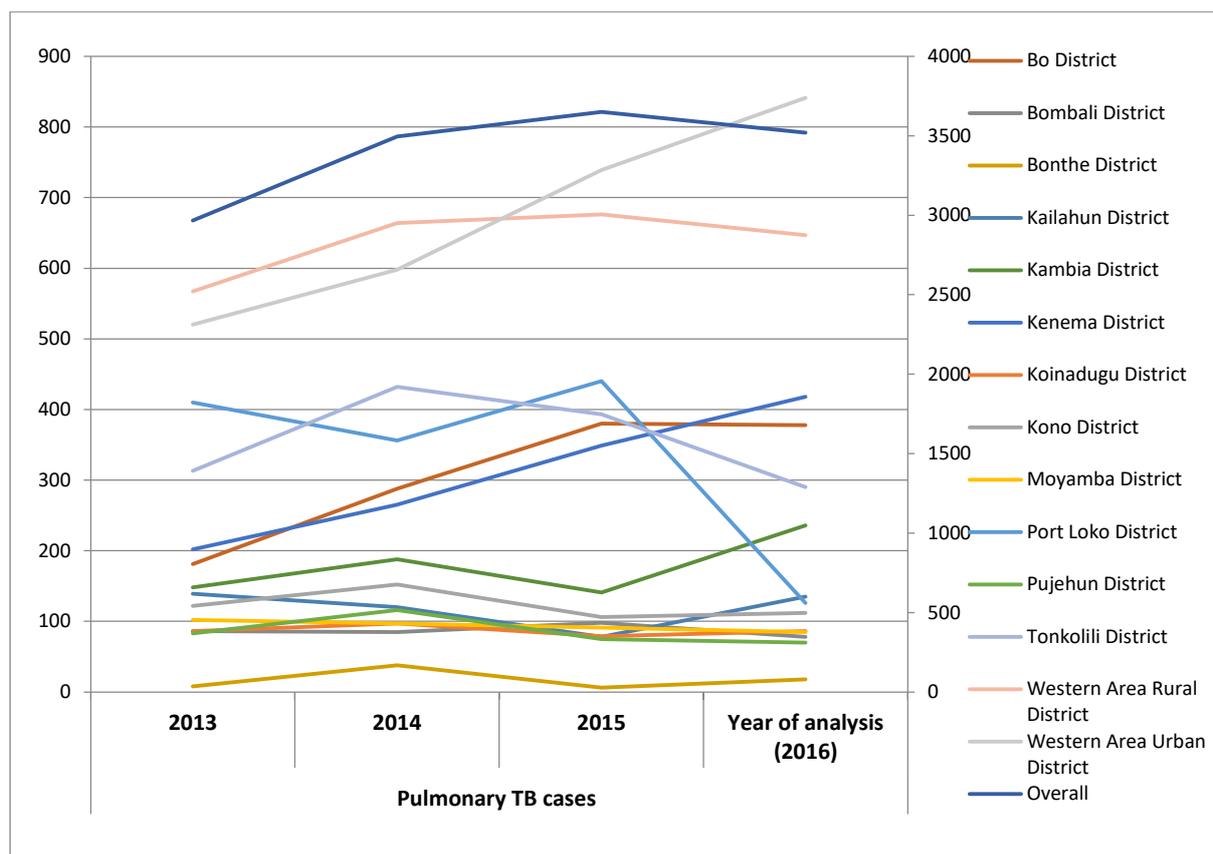


Figure 104: Line graph of pulmonary TB cases by district, 2013-2016

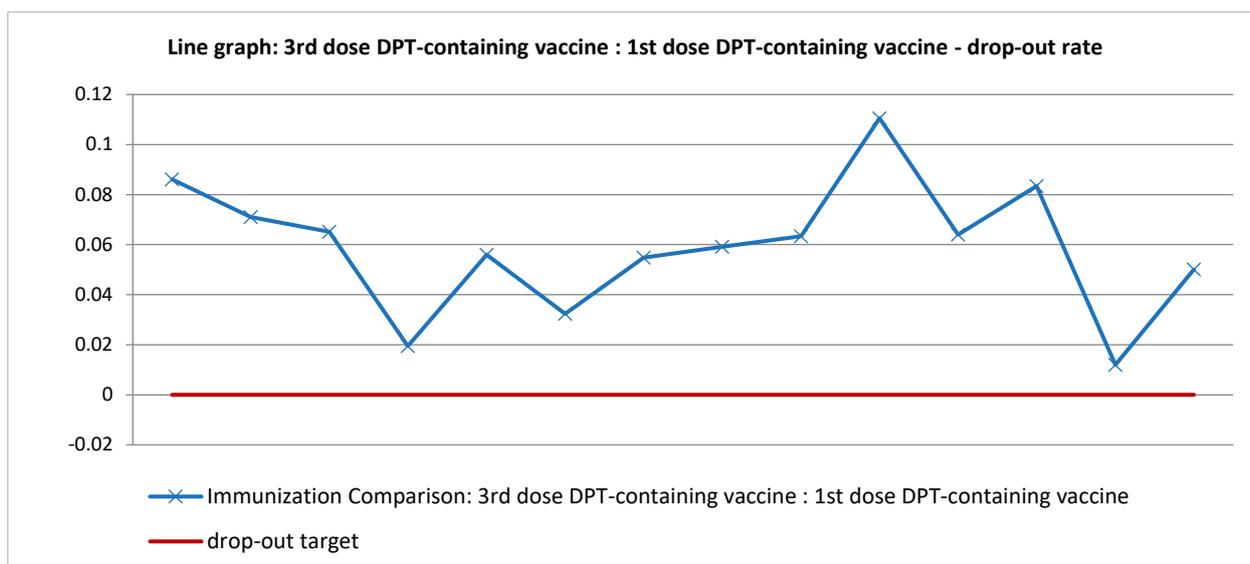


The line graph in Figure 104 gives a closer look at trends in districts for pulmonary TB cases. The right axis corresponds to the overall trend (that is, national aggregate numbers and the top most line), and the left axis corresponds to the district values. The increasing trend in the national values was driven largely by the increase in cases in only two districts: Western urban and Western rural. There was even a sharp decline in cases in Port Loko district. Most other districts appeared to have a constant trend in the data. The only district with truly aberrant results for the year of analysis appeared to be Port Loko.

3.2.6 Consistency Between Related Indicators

Indicators that have a predictable relationship can be tested to see whether the expected relationship holds in the reported data. For example, children vaccinated with a 3rd dose of pentavalent vaccine should always be fewer than those vaccinated with the 1st dose. Figure 105 displays the “drop-out rate” calculated for each district for Penta 3 for the year of analysis. A negative drop-out rate is one where Penta 3 doses are greater than Penta 1 doses and are indicated by a value less than zero. None of the districts had a negative drop-out rate so the data are considered to be of good quality for this metric.

Figure 105: Internal consistency - Comparison between related indicators - Dropout rate for Penta 3



For ANC1, a comparison was made with the number of pregnant women receiving their first dose of intermittent preventive therapy for malaria (IPT1). Those receiving IPT1 should be less than or equal to the number reported for ANC1 because all pregnant women attending ANC should receive two doses of IPT but do not always receive the first dose during the first visit. It should not be greater than ANC1. However, Kailahun district reported more IPT1 (15 839) than ANC1 (15 656) for the year of analysis (2016) (data not shown).

Pulmonary TB cases were compared with TB cases successfully completing treatment for the year 2016. Total cases for 2016 were 3520 for the TB program, whereas only 2001 completed treatment in the same period. Although it typically takes approximately eight months to complete TB treatment, and those notified in 2016 may not have completed treatment in 2016, the numbers should be roughly equal given that a similar number (3651) were notified in 2015. However, the number completing treatment was only 57% of the cases notified. This may be a problem of service delivery (a significant proportion of cases did not start, or did not complete treatment, for whatever reason) but it could potentially be a problem of reporting. Of the expected 168 district values for the year (12 months x 14 districts), 27 were blank (16%), indicating a reporting problem. A TB programme manager should review the findings to determine the reason for the low percentage of cases completing treatment.

For malaria, the number of cases testing positive was compared to the number treated for malaria. These indicators should have a 1:1 relationship in a high performing program. However, the ratio of cases testing positive to cases treated is 963/1, quite likely an artefact of reporting rather than an indication of the performance of the malaria program.

4.0 Discussion

4.1 Facility Assessment

Nearly 100% of health facilities for the programme areas report regularly to a MOHS reporting system. This is a key foundation for establishing a well-performing HMIS. The accuracy of reporting was found to be quite good as measured by the verification factor (VF), which measures the agreement between reported results and a validated figure from source documents. The VF is a ratio statistic whereby values less than 1.0 (perfect agreement) are indicative of over-reporting, whereas values greater than 1.0 indicate under-reporting. The VF was measured to be within 5% of perfect agreement for ANC 1st visit, Penta3, HCT and malaria cases. TB showed significant over-reporting, with a VF of 82%. However, it is not sufficient to rely on the VF since over-reporting and under-reporting can combine to give the impression of accurate reporting, that is, the values tend toward 1.0. For a large sample, the VF is an accurate measure of the accuracy of the data for the universe of health facilities providing the service and reporting to the information system. However, to understand trends that can ultimately hinder data quality, it is good practice to investigate the level of congruence in the data, and conversely, the level of incongruence (that is, the extent of over and under-reporting). For public health reporting, a typical standard is that the accuracy of reporting should be within $\pm 10\%$ of perfect agreement (that is, $VF = 1.0$).

For the three-month period evaluated, there was good congruence in the data for four of five tracer indicators (45% to 60% match between source documents and monthly reports). Malaria cases had far less congruence than the other indicators (24%). In addition, there was a relatively large percentage of facilities that over-reported by greater than 10% (roughly 20% of facilities for ANC, malaria, HCT, and nearly 30% for TB). Arithmetic errors and data entry errors were cited as the main reasons for discrepancies. Incorrect compilation of indicators was also a frequent cause for discrepancy, particularly for malaria and immunization. Because most facilities lack computers, the finding for data entry errors was surprising, unless survey takers understood the question to mean correct recording of indicator values manually on the reporting form.

Overall, in terms of reporting accuracy, the results were generally good, with some concern for the level of over-reporting. All targeted health programmes would likely benefit from refresher training in data management.

At the district level, the reporting accuracy for the tracer indicators was found to be optimal (99% to 100%). Completeness of reporting (the number of monthly reports received from health facilities at the district over the number expected) was also excellent (98% to 100%). The timeliness of reporting (the percentage of reports received by the reporting deadline) was not as strong as completeness, but still acceptable, at 84% to 86%. The completeness of data elements ranged from 97% to 100%, but several values showed percentages greater than 100%, indicating problems in the survey administration. These values should therefore be interpreted with caution. Another issue was that only nine districts had complete records for the DQR.

The system assessment, which evaluates the information system qualitatively, permits the identification of strengths and weaknesses and facilitates the targeting of resources for data quality improvement. Although the accuracy, timeliness and completeness of the information system were found to be good, the weaknesses identified could pose problems for future data quality if they are not addressed.

For the M&E Structure and Function domain, the “Responsibility for recording service delivery assigned to staff” scored better than 70%, a pretty good result. However, “Staff trained in data collection and compilation” was measured at only 50%, a result that could explain the finding that 9% to 18% of facilities cited problems with indicator compilation as a reason for discrepancies. Similarly, only 50% of facilities reported having a dedicated staff member available to review compiled data prior to submission to the next level. Such a practice could catch errors before they are entered into the system and become part of the permanent record. Confidentiality of patient information was also found wanting.

The use of standard definitions for indicators is an important component for accurate reporting of health system results. If health facilities have a diverse understanding of the indicator definition, they risk systematic errors in the collection of data and in reporting data that are not comparable. Use of standard definitions was measured at between 70% and 80% across all indicators, which is a result that could be improved upon.

The presence (or absence) of written guidelines for data management and reporting is a critical element for the production of good quality data. Guidelines help standardize the way data are collected, compiled, and reported, which enhances data quality and comparability. A guidelines document can ensure standard practice even if trained staff are not available to complete the task each month. Moreover, making guidelines available is relatively straightforward to implement; the central management authority need only prepare detailed instructions, and print and distribute them to all health facilities. The principal impediment is the cost; it can also be a challenge to ensure that the guidelines are up-to-date. Having printed guidelines widely available could mitigate the problem of non-standard indicator definitions in use across health facilities. The Sierra Leone DQR found that written guidelines were only available at 30% to 40% of health facilities, a result that can be easily improved.

Data quality checking was also found to be suboptimal, with most metrics in the domain scoring less than 40% of health facilities. Routine checks of the quality of reports, accuracy and consistency checks of priority indicators, and written documentation of these efforts are all good practices for maintaining data quality. Again, written documentation and policies on how to conduct data quality checks were not widely available at facilities (10% to 20%). However, the level of supervision was reported to be good (70% to 80%). Given that supervision was happening (nearly 80% of facilities had a supervisory visit in the last six months), data quality checks can be standardized, written in guidelines, and integrated in the standard procedures for staff conducting supervision of health facilities. Strong supervision with data quality checks is probably the most effective intervention for assuring data quality of public health reporting.

Increasingly, HMIS managers and health and disease programmes need to know the quality of reported results. Comparing reported results to validated results (from source documents) is one of the best methods for assessing data quality. However, this is not possible if the records are missing or disorderly. Maintenance of a quality data archive was another area that could be improved in the Sierra Leone HMIS. Less than 60% of facilities were found to have archived data stored in an orderly fashion. Less than 50% had an appropriate and adequate space (that is, clean, dry, and large enough) devoted to the data archive. Less than 50% limited access to the data to appropriate staff. This is another intervention that is easy to implement given the availability of resources.

Source documents were largely available and of the standard type (developed, printed and supplied by the HMIS management unit or programme M&E unit). Entries into the source documents were largely current. A major exception was malaria data collection forms, which were reported as available, standard, and current in only 40% of health facilities. Stockouts were infrequently reported, although 30% of facilities reported stockouts of the ANC register in the previous year, and 20% reported stockouts of immunization tally sheets.

Reporting forms were largely deemed adequate (available, HMIS issued, and standardized) for all programme areas, except for TB. Although reporting forms were found to be available in 70% to 80% of facilities for maternal health, immunization, HIV/AIDS and malaria, only 55% of TB facilities had available forms. Moreover, health programmes, other than TB, reported using HMIS forms (rather than programme-specific forms) in 86% to 96% of sampled facilities, whereas HMIS forms were used in only 65% of TB facilities. TB facilities also reported stockouts of reporting forms in the past year at nearly 20% of sampled sites.

The systems assessment revealed similar findings at the district level as the assessment carried out at the facility level, although findings from the district level should be interpreted with caution because only nine of fourteen district offices were surveyed. The absence of written guidelines to assist with data compilation and reporting was notable. Guidance was infrequently reported as available on what districts are supposed to report (37.5%), how reports are to be submitted (12.5%), and when reports are due (25%). Also, sufficient copies of blank forms for distribution to health facilities were reported for only 37.5% of district offices. Less than half the district offices (42.9%) reported having adequate and appropriate space for data archives.

Conversely, the district offices were doing well in the areas of demographic information and data use. Approximately 85% of surveyed districts reported having target populations for priority indicators and data on births and deaths (Table 57). More than 85% of districts reported having monitored the status of and tracking progress toward targets for priority indicators and having assigned staff to interpret data.

4.2 DQR Desk Review

The Desk Review is a new methodology that has the potential to vastly improve monitoring and assessment of data quality for routine public health data. However, as with most new methods, implementation was not without its problems. The analysis is standardized with tools available to facilitate implementation. The ideal tool is the DHIS 2 DQR app, which can be installed readily on the DHIS 2 given the appropriate installation files, guidance, and access to the system (that is, a certain level of administrator privileges). The analysis can also be conducted in MS Excel using data from the HMIS or health programme databases. The downside of the approach in Excel is that you must choose a level for analysis and then acquire the data for that level. It is not then possible to go below that level (for example, drill down) to investigate anomalies. Since Sierra Leone uses the DHIS 2, all efforts were made to install and use the DHIS 2 DQR app for the analysis. However, the app experienced problems that reduced its functionality and compromised the analysis. Specifically, core analysis indicators could not be defined from existing data in the DHIS 2 and, as a result, certain analyses were not possible. However, it was possible to download the data by indicator in an acceptable format (that is, monthly and annual district-level values) for use in the Excel tool. The result was that some, but not all, of the proscribed analyses were conducted, in both the DHIS 2 DQR app and the DQR Excel tool.

The completeness and consistency of the data depended heavily on the indicator in question. Data for maternal health and immunization were largely complete, but gaps were apparent in the HIV/AIDS, TB, and malaria data. For example, for malaria, the number who tested positive by district was compared with the number receiving treatment (combined with/without ACT, before/after 24 hours) for the same period (October 2016 – September 2017). The total testing positive was 1,923,601 (or, more like 1,500,000, if the large outlier is removed). The number treated for the same period for all districts was 1996. This could have been an issue of inadequate service delivery, but more likely it was due to incomplete reporting. (Another possibility is that the treatment data were being collected in a different dataset, not readily apparent on the DHIS 2.) For HCT, the total number tested was about two thirds the number receiving results and post-test counselling. The number tested should probably be more than the number receiving results and counselling, so this result was potentially due to incomplete reporting of the number tested.

There were significant outliers in the data. The value for one facility for one month of reporting on the number of positive malaria tests represents about 25% of the value of the indicator for the whole programme for the entire year. This problem is indicative not just of data quality, but also of data use. If the data were being used, it is unlikely that this outlier would have gone unnoticed given its magnitude.

The data seemed largely consistent over time for the indicators reviewed. TB cases notified showed significant variability (Fig. 103) from one district to the next, but that is not entirely unexpected for TB, the transmission dynamics of which do not result in uniform distribution of cases. HCT reporting seemed to have only begun in earnest in the third quarter of 2016; the data were markedly incomplete prior to then.

Analyses were not possible for Domains 3 and 4, the comparison with external data sources (that is, population-based surveys), and the evaluation of denominator data, respectively.

Unfortunately, the amount of time in-country by the relevant technical assistance service provider during survey implementation did not permit conducting the analysis in-country, so it was not possible to build capacity such that the MOHS in Sierra Leone could conduct these analyses independently.

5.0 Recommendations

Although the quality of the Sierra Leone HMIS data was found to be quite good regarding the accuracy of reporting, there remain several important weaknesses that can be easily addressed in the short term. The following are recommendations for improving data quality that should be formalized in strategic planning efforts, with responsible actors, timelines, and funding specified.

In response to the findings that a significant proportion of health facilities either under or over-reported on the tracer indicators, refresher training should be conducted for health facility data management staff to ensure adequate comprehension of indicator compilation protocols.

Written guidelines on the modalities of data collection, compilation, and reporting should be developed, printed, and distributed to all health facilities expected to report to the HMIS or health programmes. If such guidance exists, they should be reviewed and, if necessary, updated. Electronic copies should be made available on programme websites to facilitate access by programme personnel. Indicator reference sheets, or another form of standard presentation of indicators and their precise definitions, should likewise be made available.

The preservation of historical data at health facilities was found to be substandard. Data should be archived for future reference in a clean, dry space for which access can be limited to appropriate staff. A system of review of data archives at health facilities and in districts should be instituted to determine needs for the provision of shelving, cabinetry, locking mechanisms, and other materials for constructing, upgrading, or refurbishing storage facilities.

Data quality control mechanisms at health facility and district levels should be instituted. Supervision was deemed adequate, but current supervision lacks an emphasis on data quality, and standard data quality checks are not being conducted. A protocol for data quality checking should be developed for both district and health facility levels that outlines which data quality controls should be conducted, their frequency, and responsible staff. The results of these data quality checks should be recorded in standardized reporting templates and archived in an appropriate fashion for later reference (paper and/or electronic). Standard tools and methods are available from M&E technical assistance providers (for example, MEASURE Evaluation routine data quality tools/methods). These “off-the-shelf” solutions are appropriate, inexpensive, and simple to implement. M&E staff at higher levels (that is, region and central levels) should monitor that data quality checks are being conducted and their results.

A review of the mechanism by which printed data collection tools and reports are made available to health facilities should be conducted. Stockouts of tools are unacceptable if we are to demand high-quality data from the periphery. The tools should be scheduled for review and updating every two to three years to respond to the information needs of health programmes. Although economies of scale can be achieved through larger print runs, this often means using registers or forms long after they have stopped meeting programme needs. A regular schedule of review, updating, printing, and delivery should be established, and the needs forecast and verified by DHMTs. The central level should monitor the data on stocks at the district level and respond in a timely fashion when stock levels become too low. Logistics Management Information Systems can be used to manage stocks of printed tools, much like they are used to manage public health commodities (for example, drugs, vaccines).

The data in the DHIS 2 were found to have some significant weaknesses. Data were complete for some indicators and incomplete for others. Timeliness was poor across indicators. Significant outliers were found in several indicators for the year under review. The WHO DQR app in the DHIS 2 is a useful tool for monitoring the quality of data already reported to the DHIS 2. Programme managers and data managers should be trained in its use so that they can monitor timeliness, completeness, and consistency of reported data on a regular basis. Configuring the application the first time can be time-consuming, but once configured, it takes just a few moments to produce a detailed report with graphics for the specified indicators and levels. This is a very low cost, high impact intervention that should not be ignored by HMIS managers or programme managers who wish to improve the quality of data in their systems.

The data were quite incomplete for some indicators. An in-depth review of the data should be conducted by the different health programmes to determine the causes. Timeliness should be addressed by the health authorities. If there are systematic impediments to reporting from the facility to the district level, they should be identified and addressed. If the bottleneck is getting the data into the computer at the district level, perhaps more computers and more staff are required to ensure that the data are input in a timely manner.

A system of data analysis and review should be instituted whereby programme and data managers meet on a regular basis (for example, quarterly) to review the data in the DHIS 2 to assess its completeness, timeliness, coherence, and consistency. The WHO DQR app is a perfect tool for this exercise. The best way to improve the quality of the data is to use the data. Programme managers can thus know what is being input and how it coheres with their knowledge of service delivery dynamics. Errors can be corrected in a timelier fashion.

6.0 Conclusion

The quality of data was found to be good in the DQR conducted as part of the 2017 SARA+ in Sierra Leone. However, important weaknesses were uncovered that should be addressed in the short term.

The findings and recommendations of the DQR should be formally reviewed by the HMIS unit and health programmes and used in subsequent health sector planning events. Shortcomings identified by the assessment should be addressed in the resulting plans for improving service delivery to beneficiaries. If the DQR findings are addressed in this formal way, the odds are increased that the interventions identified to address the shortcomings will be included in the budgeting process, and that sufficient resources will be brought to bear to improve the data quality. However, many of the recommendations provided can be implemented at little to no cost, for example, adding data quality checks to already scheduled supervision, and using the DQR app in the DHIS 2 to monitor data quality in real time.

Annex II: National Level Survey Estimates

Table 59: DQR facility data verification and system assessment – National level survey estimates

Indicator and code	Programme Area	National Weighted Estimate
Percentage of facilities providing each health service, by facility type, managing authority, and milieu (N=142)		
S1	ANC1	0.97
S2	Penta 3	0.95
S3	HCT	0.52
S4	Notified cases of TB	0.19
S5	Malaria cases	0.99
Percentage of facilities providing service that report to a MOHS reporting system, by facility type, managing authority, and milieu		
S1_01	ANC1 (N=136)	1.00
S2_01	Penta 3 (N=133)	1.00
S3_01	HCT (N=87)	0.98
S4_01	Notified cases of TB (N=47)	1.00
S5_01	Malaria cases (N=141)	1.00
Among facilities providing a specific service and reporting on that service, percentage of facility-months for which the source documents and monthly reports could be located by the survey team		
S1_03	ANC1 (N=136)	0.75
S2_03	Penta 3 (N=133)	0.81
S3_03	Counselled & tested for HIV (N=86)	0.72
S4_03	Notified cases of TB (N=47)	0.84
S5_03	Malaria cases (N=141)	0.78
Among facilities providing a specific service, reporting on that service, and with all source documents and monthly reports available, percentage of facility-months for which the sum of source data is exactly equal to the reported data		
S1_04	ANC1 (N=96)	0.67
S2_04	Penta 3 (N=106)	0.58
S3_04	Counselled & tested for HIV (N=57)	0.78
S4_04	Notified cases of TB (N=35)	0.57
S5_04	Malaria cases (N=108)	0.39
Among facilities providing a specific service and reporting data, percentage of facility-months that have data for the following indicators in their monthly reports		
S1_05	ANC1 (N=136)	0.90
S2_05	Penta 3 (N=133)	0.91
S3_05	HCT (N=86)	0.83
S4_05	Notified cases of TB (N=47)	0.82
S5_05	Malaria cases (N=141)	0.92
Among facilities providing TB services and reporting data, proportion of cases with missing data for select variables in TB registers, by facility type, managing authority, and milieu (N=47)		

Indicator and code	Programme Area	National Weighted Estimate
S4_12A	Year of registration	0.13
S4_12B	Sex	0.07
S4_12C	Age	0.18
S4_12D	Disease classification	0.25
S4_12E	Type of patient	0.24
S4_12F	Bacteriological results	0.12
S4_12G	At least one missing variable	0.15
S4_12H	Proportion of facilities with cases having missing data	0.26
Facility level data verification factor, by facility type, managing authority, and milieu		
S1_06	ANC1 (N=96)	0.98
S2_06	Penta 3 (N=106)	1.01
S3_06	HCT (N=57)	1.05
S4_06	Notified cases of TB (N=35)	0.82
S5_06	Malaria cases (N=108)	0.98
ANC facility level data verification factor indicators, by facility type, managing authority, and milieu (N=96)		
S1_06	National verification factor	0.98
S1_07	% of facilities for which source data exactly matched reported data	0.48
S1_08	% of facilities that over-reported by more than 10% (V.F. < 0.90)	0.19
S1_09	% of facilities that under-reported by more than 10% (V.F. > 1.10)	0.08
ANC reasons for discrepancy between source data and reported data, by facility type, managing authority, and milieu (N=136)		
S1_10A	No discrepancy	0.39
S1_10B	Data entry errors	0.19
S1_10C	Arithmetic errors	0.29
S1_10D	Information from all source documents not compiled correctly	0.09
S1_10D	Source document and/or monthly report not available	0.01
PENTA3 facility level data verification factor indicators, by facility type, managing authority, and milieu (N=16)		
S2_06	National verification factor	1.01
S2_07	% of facilities for which source data exactly matched reported data	0.51
S2_08	% of facilities that over-reported by more than 10% (V.F. < 0.90)	0.13
S2_09	% of facilities that under-reported by more than 10% (V.F. > 1.10)	0.14
PENTA3 reasons for discrepancy between source data and reported data, by facility type, managing authority, and milieu (N=133)		
S2_10A	No discrepancy	0.43

Indicator and code	Programme Area	National Weighted Estimate
S2_10B	Data entry errors	0.20
S2_10C	Arithmetic errors	0.17
S2_10D	Information from all source documents not compiled correctly	0.18
S2_10E	Source document and/or monthly report not available	0.01
HCT facility level data verification factor indicators, by facility type, managing authority, and milieu (N=57)		
S3_06	National verification factor	1.05
S3_07	% of facilities for which source data exactly matched reported data	0.64
S3_08	% of facilities that over-reported by more than 10% (V.F. < 0.90)	0.16
S3_09	% of facilities that under-reported by more than 10% (V.F. > 1.10)	0.08
HCT reasons for discrepancy between source data and reported data, by facility type, managing authority, and milieu (N=86)		
S3_10A	No discrepancy	0.44
S3_10B	Data entry errors	0.12
S3_10C	Arithmetic errors	0.16
S3_10D	Information from all source documents not compiled correctly	0.13
S3_10E	Source document and/or monthly report not available	0.08
TB facility level data verification factor indicators, by facility type, managing authority, and milieu (N=35)		
S4_06	National verification factor	0.82
S4_07	% of facilities for which source data exactly matched reported data	0.57
S4_08	% of facilities that over-reported by more than 10% (V.F. < 0.90)	0.31
S4_09	% of facilities that under-reported by more than 10% (V.F. > 1.10)	0.05
TB reasons for discrepancy between source data and reported data, by facility type, managing authority, and milieu (N=47)		
S4_10A	No discrepancy	0.32
S4_10B	Data entry errors	0.21
S4_10C	Arithmetic errors	0.21
S4_10D	Information from all source documents not compiled correctly	0.08
S4_10E	Source document and/or monthly report not available	0.11
Malaria facility level data verification factor indicators, by facility type, managing authority, and milieu (N=18)		
S5_06	National verification factor	0.98

Indicator and code	Programme Area	National Weighted Estimate
S5_07	% of facilities for which source data exactly matched reported data	0.29
S5_08	% of facilities that over-reported by more than 10% (V.F. < 0.90)	0.20
S5_09	% of facilities that under-reported by more than 10% (V.F. > 1.10)	0.08
Malaria reasons for discrepancy between source data and reported data, by facility type, managing authority, and milieu (N=141)		
S5_10A	No discrepancy	0.24
S5_10B	Data entry errors	0.23
S5_10C	Arithmetic errors	0.29
S5_10D	Information from all source documents not compiled correctly	0.20
S5_10E	Source document and/or monthly report not available	0.03
M&E Structure and Function		
SAF_100	Responsibility for recording service delivery assigned to staff	0.72
SAF_101	Staff trained in data collection and compilation	0.55
SAF_102	Dedicated staff to review aggregate numbers before submission	0.56
Indicator Definitions and Reporting Guidelines		
SAF_103_01	Number of ANC1 visits- standard definition	0.70
SAF_103_02	Number of Penta3- standard definition	0.71
SAF_103_03	Counselled & tested for HIV - standard definition	0.78
SAF_103_04	TB cases treatment- standard definition	0.73
SAF_103_05	Suspect malaria cases treated- standard definition	0.80
SAF_104_01	There are written guidelines on what they were supposed to report on	0.30
SAF_104_02	There are written guidelines on how reports are to be submitted	0.30
SAF_104_03	There are written guidelines on to whom the reports should be submitted	0.36
SAF_104_04	There are written guidelines on when the reports are due	0.34
Data Quality and Supervision		
SAF_109	Routine process for checking quality of reports	0.36
SAF_110	Accuracy checks are routinely conducted	0.36
SAF_111	Consistency checks of summarized data are routinely conducted	0.35
SAF_112	Checks for timely entry and completeness are routinely conducted	0.52
SAF_113	Written documentation of the results of data quality controls	0.21
SAF_114	Written policy on how to conduct data quality checks	0.13

Indicator and code	Programme Area	National Weighted Estimate
SAF_115	Facility receives regular supervisory visits	0.68
SAF_116	Documented supervisory visit in past six months	0.79
Data Maintenance and Confidentiality		
SAF_117	Copies of submitted reports for past 12 months available	0.90
SAF_118	Filled data collection forms for last 12 months available	0.85
SAF_119	Archived data organized	0.58
SAF_120	Appropriate and adequate space for organization of reports	0.46
SAF_121	Access to data limited to the appropriate staff	0.47
SAF_122	For computerized systems, database administration procedure in place	0.02
SAF_123	Date of latest back-up is appropriate	0.02
SAF_124	Computerized system password protected	0.03
SAF_125	Personal data maintained according to confidentiality guidelines	0.54
Data Collection Tools - ANC Register		
SAF_106_001A	ANC1 register- forms available	0.96
SAF_106_001B	ANC1 register- standardized tools/forms	0.87
SAF_106_001C	ANC1 register- entries up to the current day	0.92
SAF_106_001D	ANC1 register- stockout in last 12 months	0.30
Data Collection Tools - Immunization Tally Sheets		
SAF_106_002A	Immunization tally sheets- forms available	0.87
SAF_106_002B	Immunization tally sheets- standardized tools/forms	0.86
SAF_106_002C	Immunization tally sheets- entries up to the current day	0.79
SAF_106_002D	Immunization tally sheets- stockout in last 12 months	0.20
Data Collection Tools - HCT Register		
SAF_106_003A	HCT register- forms available	0.88
SAF_106_003B	HCT register- standardized tools/forms	0.88
SAF_106_003C	HCT register- entries up to the current day	0.78
SAF_106_003D	HCT register- stockout in last 12 months	0.12
Data Collection Tools - TB Register		
SAF_106_004A	TB register- forms available	0.98
SAF_106_004B	TB register- standardized tools/forms	0.98
SAF_106_004C	TB register- entries up to the current day	0.96
SAF_106_004D	TB register- stockout in last 12 months	0.14
Data Collection Tools - Malaria Diagnostic and Testing Register		
SAF_106_005A	Malaria diagnostic and testing register- forms available	0.43
SAF_106_005B	Malaria diagnostic and testing register- standardized tools/forms	0.38
SAF_106_005C	Malaria diagnostic and testing register- entries up to the current day	0.43
SAF_106_005D	Malaria diagnostic and testing register- stockout in last 12 months	0.04

Indicator and code	Programme Area	National Weighted Estimate
SAF_107	Standard reporting form for all health programmes	0.55
Adequacy of Reporting Forms - Maternal Health Services		
SAF_108_001A	Maternal health- forms available	0.82
SAF_108_001B	Maternal health- HMIS or programme form	0.91
SAF_108_001C	Maternal health- standardized tools/forms	1.00
SAF_108_001D	Maternal health- stockout in the last 12 months	0.13
Adequacy of Reporting Forms - Immunization Services		
SAF_108_002A	Child health/immunization- forms available	0.81
SAF_108_002B	Child health/immunization- HMIS or programme form	0.95
SAF_108_002C	Child health/immunization- standard or improvised form	0.98
SAF_108_002D	Child health/immunization- stockout in the last 12 months	0.10
Adequacy of Reporting Forms - HIV Services		
SAF_108_003A	HIV/AIDS- forms available	0.72
SAF_108_003B	HIV/AIDS- HMIS or programme form	0.86
SAF_108_003C	HIV/AIDS- standard or improvised form	1.00
SAF_108_003D	HIV/AIDS- stockout in the last 12 months	0.06
Adequacy of Reporting Forms - TB Services		
SAF_108_004A	TB- forms available	0.55
SAF_108_004B	TB- HMIS or programme form	0.65
SAF_108_004C	TB- standard or improvised form	0.93
SAF_108_004D	TB- stockout in the last 12 months	0.19
Adequacy of Reporting Forms - Malaria Services		
SAF_108_005A	Malaria- forms available	0.75
SAF_108_005B	Malaria- HMIS or programme form	0.96
SAF_108_005C	Malaria- standard or improvised form	1.00
SAF_108_005D	Malaria- stockout in the last 12 months	0.02



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