

ORIGINAL ARTICLE

Leveraging Existing Laboratory Capacity towards Universal Health Coverage: A Case of Zambian Laboratory Services

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ABSTRACT

Background: The provision of quality health care is influenced by the availability and capacity of the support systems such as the laboratory. The Service Availability and Readiness Assessment (SARA) by the Ministry of Health with support from WHO Zambia aimed to establish the availability levels of basic amenities required for quality health care including selected diagnostic tests that normally should be conducted at general hospitals and most health facilities. Adequately equipped clinical laboratories should provide early warning signals of health risks. The Assessment categorized the laboratories at three levels relating to the type of facility, these being hospital, health center and health post. This study used results from the SARA to determine the ability to make timely diagnosis, towards the Universal Health Coverage goals.

Methods: The general service readiness, the service specific readiness and diagnostic capacity were measured to determine overall capacity, ability of facilities to offer specific services and the mean availability of 8 basic lab tests respectively according to the guidelines in the SARA reference manual, version 2.1.

Single stage stratified random sampling method was used to select facilities. A total of 234 health facilities were randomly sampled from 86 districts with 231 visited for assessment. In each stratum, a proportionate of health facilities was selected. Sample was weighted against all facilities. Analysis of data was done using STATA version 13.0. Descriptive analysis was done and data presented as percentages.

Results: A total of 231 (99%) out of 234 health facilities took part in the study. Most health facilities had the capacity to diagnose malaria (99%) and HIV (94%). A third (33%) of the facilities had capacity to diagnose blood glucose. The mean of tracer items was 66%. Compared across provinces, the Central (71%), Luapula (73%), and Southern (74%) provinces had higher mean availability of diagnostic capacity tracer items (ADCTI), while North-western province (48%) had the least mean ADCTI. Among the health type, hospitals had the highest mean ADCTI (87%); followed by health centres (70%) and health posts (46%). Private health facilities had a mean ADCTI of 76% compared to those of public health facilities of 63%. With regard to residence, the mean ADCTI for facilities in urban areas was 71% compared to that of facilities in rural areas of 63%. Overall, 12% of the facilities reported all the 8 tracer items for diagnosis.

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Discussion: Although the mean availability of tracer items was found to be 66%, very few facilities (12%) had full diagnostic capacity. This status limits the ability to carry out the objective of Universal Health Coverage which is aimed at providing basic services for all at minimal cost. Only about a third of facilities had the capacity to diagnose blood glucose and yet Zambia has a high prevalence of diabetes. The capacity for health facilities to conduct essential tests in Zambia is low. Laboratory support is urgently needed to enhance service delivery in the country especially with regards to timely diagnosis of diseases of public health significance.

Conclusion: Although Zambia has not attained the ideal height of providing the basic diagnostic services to all as per aim of the Universal Health coverage, the capacity according to the SARA 2015 report has improved from 45% in 2010 to 66% in 2015.

INTRODUCTION

The provision of quality health care is influenced by the availability and capacity of the support systems such as the laboratory. The provision of quality health care is influenced by the availability and capacity of the support systems such as the laboratory. The Service Availability and Readiness Assessment (SARA) aims to establish the availability levels of basic equipment, basic amenities, essential medicines, and diagnostic capacities, and the readiness of health facilities to provide basic health-care interventions that should be available at general hospitals and most health facilities. Information generated through SARA on the supply and quality of health services is necessary for health systems management, monitoring, and evaluation.¹ In Zambia, the SARA has been used to assess service availability and readiness for utilization. Prior to the 2015 SARA, others were conducted in 2008 and 2010.² Zambia does not have designated public health laboratories but relies on clinical laboratories to function as public health laboratories. Adequately equipped clinical laboratories should provide early warning signals of health risks. Teams of clinical laboratory experts should be equipped to provide early warning signals of health risks.³

The SARA Tool has been utilized by various countries. The Republic of Moldova in Europe conducted its first

SARA in 2014. In the Africa region, literature reveals over 10 countries conducted SARA between 2010 and 2016 including francophone Burkina Faso and Benin, Anglophone Tanzania, Kenya and Uganda among others. The general service readiness score among countries that have done the SARA in the Africa region remains relatively low with Zambia at 66% compared to Kenya at 57%, Uganda at 47% and Tanzania at 29%.⁴ There is no data in literature on other regions. The report on the Republic of Moldova indicates the plan of how SARA could be conducted.⁵

Medical laboratory services in Zambia are provided primarily by the government. Missions, Industries in particular the mines, military and private institutions also provide laboratory services at various levels of care. Though mostly providing clinical care activities, there is limited provision of clinical and research activities. As of 2012 assessment, a total of 260 medical laboratories in the public sector and over 50 in the private sector existed mostly among the hospitals. In setups such as health posts without laboratory infrastructure and inadequate staffing levels, point of care testing provided by non-laboratory professionals using simple rapid technology have been adopted. It is recognized that laboratories continue to play a critical role in patient management, disease control and prevention.⁶ However, laboratory services are challenged with low funding, poor laboratory infrastructure and low staffing levels in general and this may compromise the ability to function effectively in areas of clinical and public health matters.⁷ This study uses results from the SARA to determine the ability and capabilities of health institutions in Zambia to make timely diagnosis of diseases of public health concern towards the Universal Health Coverage goals considering limited availability of public health laboratory services.

METHODS

The study analysed results from the Zambia 2015 SARA report to determine the availability and readiness of the existing laboratories in Zambia to provide basic diagnostic services towards Universal Health Coverage. The Service Availability and Readiness Assessment (SARA) tool developed by WHO and USAID was used to determine the availability and readiness of health

facilities to provide basic packages required for essential health services.

The SARA assessed among others the capacity of existing laboratories in Zambia to perform selected basic diagnostic tests that should be conducted in general hospitals and most health facilities. The capacity to diagnose tracer items as a basic capacity component was used as a measure of readiness. Availability of the following diagnostic capabilities (tracer items) were determined: malaria diagnostic capacity, HIV diagnostic capacity, urine dipstick-protein, urine dipstick-glucose, syphilis rapid test, urine test for pregnancy, haemoglobin and blood glucose.

A stratified sample by type of health facility, residence and managing authority of 234 health facilities from 86 districts was determined. Facilities were selected using single stage stratified random sampling with the Master Facility List (MFL) used as sampling frame. Data was collected using questionnaires manually and electronically simultaneously from each respondent at the health facilities by two interviewers to enhance data quality.

Sampling

Altogether, 234 health facilities were randomly sampled from 86 districts with 231 visited for assessment. In each stratum, a proportionate of health facilities was selected. Sample was weighted against all facilities.

The main domains that were assessed concerned diagnostic capacity as per guidance in the SARA manual and included:

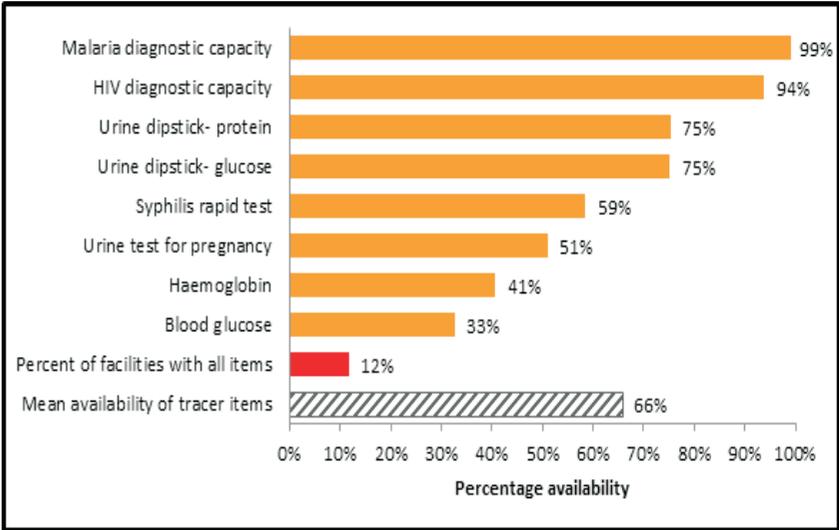
1. General service availability to determine the overall capacity.
2. Service specific readiness to determine the ability of health facilities to offer and provide diagnostic services which are measured through consideration of tracer items in this case diagnostic capacity as shown by Mean Availability of Diagnostic Capacity Tracer items.

3. Diagnostic Capacity which is measured by the mean availability of 8 basic laboratory tests on site using appropriate equipment

RESULTS

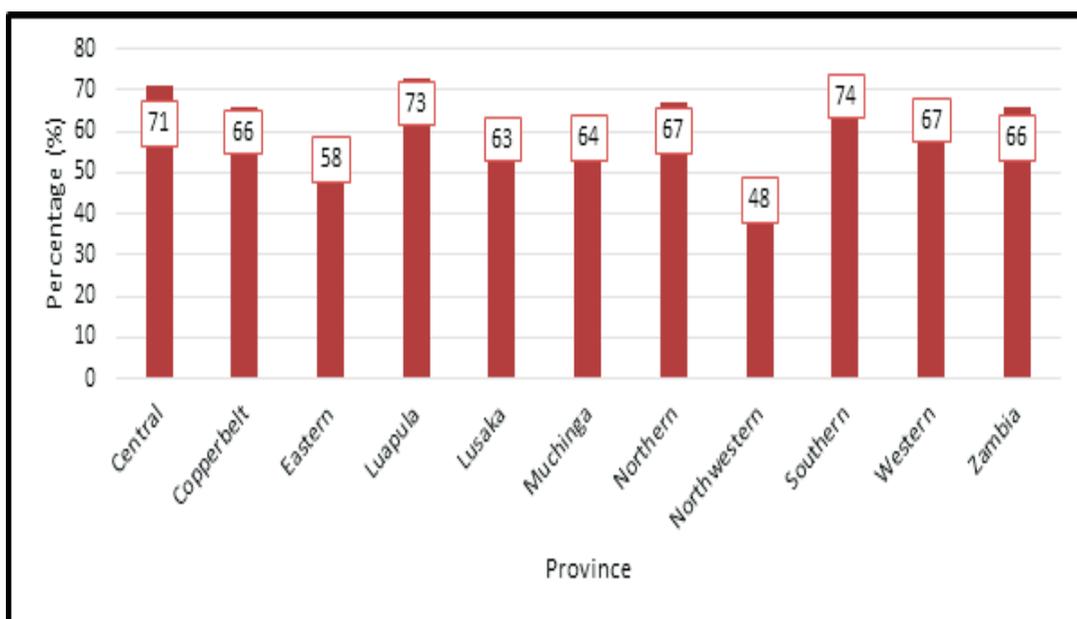
A total of 231 out of 234 health facilities took part in the study, giving a response rate of 99%. Only 12% of the health facilities had all the tracer items with a mean availability of tracer items of 66%. Figure 1 shows the distribution of facilities by tracer item. Most health facilities had the capacity to diagnose malaria (99%) and HIV (94%). Less than half of the facilities had capacity to determine haemoglobin (41%) and blood glucose (33%). However, 75% of the facilities could determine glucose using urine dipsticks.

Figure 1: Percentage of facilities with diagnostic capacity in Zambia, 2015



Comparisons of mean availability of diagnostic capacity tracer items between provinces showed that Northwestern province had the least mean availability (4%) of diagnostic tracer items. Highest means of availability of diagnostic capacity tracer items were reported in Southern (74%), Luapula (73%) and Central (71%) province (Figure 2).

Figure 2: Mean Availability of diagnostic capacity tracer items by Province, Zambia



Analysis of each tracer item by province is shown in Figure 3. Over ninety percent of all health facilities in all provinces had capacity to diagnose malaria and HIV, except Lusaka and North-western provinces in which 78% and 79% of the facilities, respectively, were able to diagnose HIV. Less than half of the facilities in seven provinces were able to determine haemoglobin with only 17% of health facilities in Lusaka province being able to do so. Overall, less than half of the facilities in 8 provinces were able to determine blood glucose, with only 6% of the health facilities in Muchinga, 12% in Eastern and 14% in Western province being able to do so.

Figure 3: Percentage of facilities with diagnostic Capacity items by Province, Zambia 2015

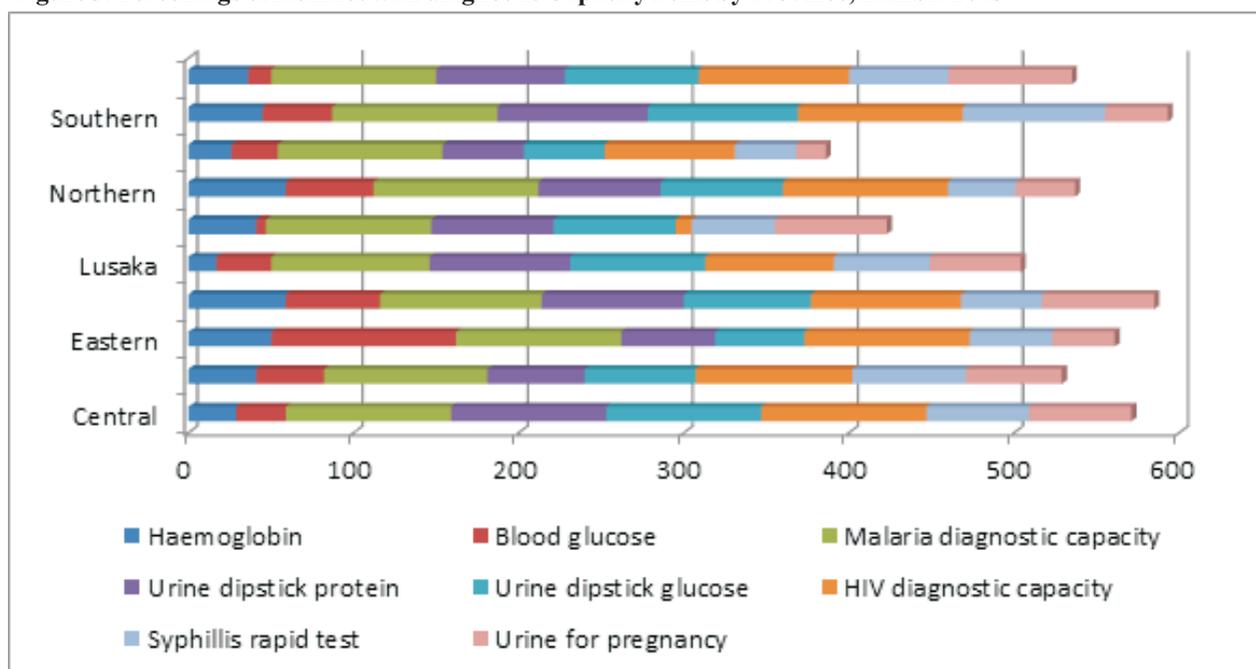


Table 2 shows the distribution of mean availability of diagnostic capacity tracer items by facility type, managing authority and residence. Mean availability of diagnostic capacity tracer items was highest in hospital, when compared to private health facilities and urban health facilities.

Table 2: Mean Availability of Diagnostic Capacity Tracer items by facility type, managing authority and residence

Background characteristics	Mean tracer items (%)
Facility type	
Hospital	87
Health Centre	70
Health Post	46
Managing authority	
Public	63
Private	76
Residence	
Urban	71
Rural	63

Comparing percent of health facilities with diagnostic capacity items by facility type, 37% of hospitals, 13% of health centres and 0% of health posts had all items. Over ninety percent of health facilities in all facility types were able to diagnose malaria and HIV. However, less than half of all health posts had other trace items. In terms of managing authority, 6% of public health facilities compared with 28% of private health facilities had all items. However, for each item, a higher percentage of private than public health facilities had them. Meanwhile, 6% of health facilities in urban areas compared to 13% in rural areas had all items. However, for each item, higher percentage of health facilities in urban than rural areas had them.

Table 3: Percentage of facilities with diagnostic Capacity items by facility type, managing authority and residence, Zambia 2015

Background characteristic		Blood glucose	Malaria diagnostic capacity	Urine dipstick- protein	Urine dipstick- glucose	HIV diagnostic capacity	Syphilis rapid test	Urine test for pregnancy	Percent of facilities with all items
Facility type									
Hospital	59	87	96	95	96	96	75	91	37
Health Centre	46	36	100	82	82	94	61	54	13
Health Post	14	6	97	43	41	92	44	26	0
Managing authority									
Public	39	25	99	74	73	94	54	42	6
Private	45	56	99	80	81	93	72	79	28
Residence									
Urban	42	45	99	86	87	95	59	58	9
Rural	40	26	99	70	69	93	58	48	13

DISCUSSION

Of the 231 health facilities who took part in the study slightly more than 10% of the facilities had all tracer items available with a mean availability of tracer items of 66%. More than 90% of facilities had capacity to diagnose malaria and HIV while less than half had capacity to diagnose haemoglobin and blood glucose. In general it was evident that the number of facilities able to diagnose all tracer items was higher in rural areas but for individual trace items it was higher in urban facilities. The assessment also revealed over 75% diagnostic capacity among the private facilities compared to 63% among the public facilities.

The SARA Tool has been utilized by various countries. Moldova, in Europe, conducted its first SARA in 2014. In the Africa region, literature reveals over 10 countries have

conducted SARA between 2010 and 2016 including francophone Burkina Faso and Benin, Anglophone Tanzania, and Uganda among others. On average, Zambia had the highest mean diagnostic capacity of common basic tracer items analysed at 66% in 2015, while Uganda had a score of 47% in 2013 and Tanzania 29% in 2012. The Mean diagnostic capacity by health facilities in Zambia is relatively higher than others in the region such as Tanzania, Kenya and Uganda. Comparing Zambia, Uganda and Tanzania on specific tracer diagnostic capacity, all countries had similar trends with higher capacity in Malaria and HIV on one hand, and lower in capacity to diagnose blood glucose and haemoglobin on the other hand as follows: diagnostic capacity of Malaria (99: 89:74); HIV (98:70:62) and lower diagnostic capacity for Blood glucose (33:39:14) and Haemoglobin (41:29:20) respectively.⁴

Enhanced diagnostic capacity is important in the provision of quality health care. Laboratory systems are an important support system required to ensure quality basic health for all. Increased incidence of diseases of public health significance, including communicable, neglected or non-communicable diseases, require a robust laboratory service to timely and adequately detect and confirm these diseases.⁸ The Universal Health Coverage (UHC) mandate aims to “ensure all people obtain the health services they need without suffering financial hardships when paying for them”. It is important therefore that countries strengthen their capacities to quickly diagnose diseases for proper patient care and for timely response to epidemics. To ensure that the UHC objective is met, there is need to increase and improve capacity of the existing facilities to provide basic diagnostic services. The Zambian government is dedicated to improving the capacities of public health laboratories to provide timely and quality results for good patient management as well as public health management.⁹ The SARA 2015 report indicates an improvement in health facility capacity to provide diagnostic services. The 2015 results compared to 2008 and 2010 SARA data evidenced an increment in availability of most tracer items with the exception of blood glucose, for diagnostic capacity from 45% in 2010 to 66% in 2015.²

CONCLUSION

Although Zambia has not attained the ideal height of providing the basic diagnostic services to all as per Universal Health coverage, the capacity has improved from 45% in 2010 to 66% in 2015. The commitment by the Zambian government to improve access of all of its population to basic diagnostic facilities in line with the UHC objective is evidenced by the ongoing improvement. The government must continue its commitment to improve and widen the scope of the diagnostic facilities towards the UHC mandate.

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