

# Survey of Users' Perceptions of Clinical Microbiology Laboratory Services in Nigeria

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## ABSTRACT

**Background:** The Clinical Microbiology laboratory is expected to adequately measure and monitor its performance by actively and routinely soliciting from its clients their level of satisfaction with services received and use the information to develop processes that meet customer's needs. This survey was done in order to objectively identify some of the challenges faced by laboratory end users in Nigeria with a view to proffering feasible solutions to such problems.

**Methods:** Semi-structured, pre-tested Questionnaires administered to laboratory users in 2 teaching hospitals in Nigeria to find out their level of satisfaction with various aspects of laboratory services. One is a Federal Government hospital with 620 bed spaces and 7 full time Consultant Clinical Microbiologists while the other hospital is owned by State Government and has 280 bed spaces, 1 full time plus 2 visiting Consultant Clinical Microbiologists.

**Results:** There is a general low level customer satisfaction observed in this study. Only 27.8% and 5.4% of respondents from UCH and LTH respectively agreed that laboratory user's handbook was available while about 38.3% and 22.5% respectively agreed that laboratory turnaround time was satisfactory. Respondents from UCH and LTH who agreed that it was easy to obtain expert advice from Consultant Clinical Microbiologists were 45.1% and 20.2% respectively. About 94.7% and 88.8% of respondents from UCH and LTH respectively agreed that request forms were easy to fill while 76.7% and 68.5% respectively agreed that expert advice obtained from Consultant Clinical Microbiologists were helpful in the management of their patients.

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*Discussion, conclusion and recommendation: The general low level of customer satisfaction observed from the 2 hospitals may be attributable to the general inadequate health workforce and infrastructure in Nigeria where the government spend only 6.4% of its annual budget on health which is far below expectation. The particularly lower level of customer satisfaction in LTH may be due to the fact that there is only one full time Clinical Microbiologist in the in the laboratory. These laboratories can make the best out of the situation at hand by improving their communication with the users so as to make them appreciate the actual cost of tests and time required to generate results.*

**Keywords:** Consultant, Customers, Microbiologist, Performance, Services

### Background

In the current literature on Quality Management System, the Clinical Microbiology laboratory is expected to adequately measure and monitor its performance by actively and routinely requesting for a feedback from its customers on how satisfied they are about the services received<sup>1</sup>. By this, the laboratory will be able to identify the needs and expectations of its customer and use the information to develop processes that meet these needs.

Provided that the external quality control, internal quality control and accuracy of test results are satisfactory, the Clinical laboratory may tend to assume that the services provided must be a good one<sup>2</sup>. This assumption is aided by the fact that many laboratory users rarely make one-one-one contact with the Clinical Microbiologists to complain about unsatisfactory laboratory services.

Insufficient number of Clinical Microbiologists to provide effective supervision of laboratory services and liaise with laboratory users is another factor that may have ripple effects on laboratory performance and customer satisfaction. A survey of workload and stress among Consultant Clinical Microbiologists in United Kingdom (UK) showed that an

increasing number of consultants are saving towards early retirement or seeking alternative employment as a result of excessive workload<sup>3</sup>.

Another survey in United State of America (USA) revealed a similar trend with 37% of the staff in the Clinical Microbiology department doing double shift or overtime<sup>4</sup>.

High work load has been found to be associated with burnout, low morale and high turnaround time which in turn can lead to delay decision-making and therefore increases the risk of delayed discharges<sup>5</sup>. Delays in clinical decision-making increase the amount of time when patients' statuses are uncertain. Such uncertainty increases the risk of adverse events and malpractice exposure. Delay discharges increase cost of patient care which further suppresses the hospital's operating margin, trapping the hospital in a vicious cycle of low performance and low profitability<sup>5</sup>.

In other to objectively find out some of the difficulties experienced by laboratory customers in Nigeria and possibly come up with recommendations to address the problems, we decided to send out a questionnaire to randomly selected end users of our service, who are mainly clinicians.

## Methods

This study was carried out at two tertiary hospitals in South-west Nigeria; the Federal government owned University College Hospital (UCH), Ibadan and the State government owned Ladoke Akintola University of Technology-Teaching Hospital (LTH), Osogbo. UCH has 620 bed spaces and 7 full time clinical microbiologists while the latter has 280 bed spaces, 1 full time plus 2 visiting Clinical Microbiologists.

To each hospital was distributed 150 copies of self-administered questionnaire consisting of 4 sections which included demographic characteristics of the respondents, assessment of Pre-analytical phase of laboratory service, assessment of laboratory personnel and assessment of the post analytical phase of the laboratory services. The questionnaire was limited to two sides of A4 paper only to make it less voluminous for the respondents. A Likert

scale system of answers <sup>6</sup> was used, giving the respondents opportunity to choose between a range of possible answers.

The data collected was analyzed using the free GNU PSPP software for statistical analysis version 0.7.9-gd4ae90. Using the descriptive statistics in the analysis command, the answers to the questions were cross tabulated against the 2 laboratories involved to generate frequency tables.

## Results

One hundred and thirty three (88.7%) completed questionnaires were retrieved from UCH while 89 (59.3%) were retrieved from LTH. Most of the respondents in our study were in the junior cadre, House officers (41.4%) and Resident Doctors (42.8%) who are usually constitute the bulk of medical workforce in Nigerian Teaching Hospitals and also the first

**Table 1.** Demographic characteristics of the respondents.

Characteristics		UCH	LTH	TOTAL
		Frequency (%)	Frequency (%)	Frequency (%)
Sex	Male	64(48.1)	73(82.0)	137(61.7)
	Female	69(51.9)	16(18)	85(38.3)
Status	House officer	78(58.6)	14(15.7)	92(41.4)
	Registrar	30 (22.6)	65(73.0)	95(42.8)
	Senior Registrar	18(13.5)	6(6.7)	24(10.8)
	Consultant	7(5.3)	4(4.5)	11(5.0)
	Dept	Medicine	18(13.5)	24(27.0)
	Surgery	16(12.0)	16(18.0)	32(14.4)
	O & G	14(10.5)	5(5.0)	19(8.6)
	Pediatric	10(7.5)	11(12.4)	21(9.46)
	Others	75(56.4)	33(37.1)	108(48.7)
Frequency of laboratory patronage per week				
	1-2	52 (39.1)	46(51.7)	98(44.1)
	3-4	31(23.3)	6(6.7)	37(16.7)
	>4	50 (37.6)	37(41.6)	87(39.20)

O&G = *Obstetrics and Gynecology.*

**Table 2.** Assessment of Pre-analytical phase of the laboratory (Lab).

Parameter	UCH			LTH		
	Frequency (%)			Frequency (%)		
	Agree	Disagree	Not sure	Agree	Disagree	Not sure
Lab user's handbook is available.	37(27.8)	49(36.8)	47(35.8)	5(5.4)	39(43.8)	44(49.4)
Lab request forms are freely available.	114(85.5)	14(10.5)	5(3.8)	46(51.7)	38( 42.7)	5(5.6)
Lab request forms are easy to fill.	126(94.7)	6(4.5)	1(0.8)	79(88.8)	4(4.5)	6(6.7)
Specimen bottles are freely available.	60(45.1)	62(46.6)	11(8.3)	44(49.4)	24(27.0)	21(23.6)
Required test is mostly available.	67(50.4)	60 (45.1)	6 (4.5)	29(32.6)	47(52.8)	13(14.6)
Sending specimen to the lab is easy.	74(55.6)	45(33.8)	14(10.5)	48(53.9)	30(33.7)	11(12.4)
Price of most tests are reasonable	51(33.8)	65(48.9)	17(12.8)	20 (22.5)	56(62.9)	13(14.6)
Emergency lab services are easily obtainable.	17(12.8)	82(61.7)	34 (25.6)	12(13.5)	54(60.7)	23(25.8)

to come in contact with patients in most cases (Table 1).

Only 37(27.8%) and 5(5.4%) of the respondents from UCH and LTH respectively agreed that laboratory user's handbook is available. Few of the respondents also agreed that the price of the laboratory tests is reasonable, 51 (33.8%) and 20 (22.5%) from UCH and LTH respectively (Table 2). Regarding turnaround time, 51(38.3%) from UCH and 17(19.1%) from LTH agreed that they are satisfied. About 60(45.1%) and 18 (20.2%) of the respondents from UCH and LTH respectively agreed that it is easy to obtain expert advice from Consultant Clinical Microbiologists. Most of the customers from the 2 hospitals did not agree that laboratory personnel are courteous (Table 3).

Some of the areas where the laboratory users express high level of satisfaction include ease

of filling request form, legibility of test results and usefulness of expert advice obtained from Consultant Clinical Microbiologists. About 126(94.7%) and 79(88.8%) of the customers from UCH and LTH respectively agreed that request form is easy to fill while 97(72.9%) and 72(80.9%) respectively agreed that test results are legibly written. Respondents from both hospitals also scored the laboratories relatively high regarding the usefulness of expert advice obtained from Consultant Clinical Microbiologists in the management of their patients which was 102(79.7%) and 61(68.5%) from UCH and LTH respectively (Table 3). Regarding the perceived usefulness the expert advice in relation to departments and status of the users, Thirty three (78.6%) of all the respondents from medicine department ( $p=0.05$ ) and 79.3% of all the responding House Officers ( $p=0.02$ ) agreed to the usefulness of such advice (Table 4).

**Table 3.** Assessment of laboratory personnel and Post analytic aspect of the laboratory

Parameter	UCH			LTH		
	Frequency (%)			Frequency (%)		
	Agree	Disagree	Not sure	Agree	Disagree	Not sure
Receptionists are courteous.	50(37.6)	49(36.8)	34(25.6)	20(22.5)	36(40.4)	33(37.1)
Technical personnel are courteous.	40(36.1)	44(33.1)	41(30.8)	28(31.5)	25(28.1)	36(40.4)
Medical personnel are courteous.	56(42.1)	34(25.6)	43(32.3)	45(50.6)	13(14.6)	31(34.8)
Expert advice is easily obtained from Consultant Microbiologist	60(45.1)	49(36.8)	24(18.0)	18(20.2)	39(43.8)	32(36.0)
Expert advice is usually helpful.	102 (76.7)	25(18.8)	6(4.5)	61(68.5)	6(6.7)	22(24.7)
Test results are legible	97(72.9)	26(19.5)	10(7.5)	72(80.9)	5(5.6)	12(13.5)
Printed result is preferable	118(88.7)	9(6.8)	6(4.5)	58(65.2)	13(14.6)	18(20.2)
Test results are usually reliable	86(64.7)	29(21.8)	18(13.5)	25(28.1)	29(32.6)	35(39.3)
Laboratory turnaround time is satisfactory.	51(38.3)	67(50.4)	15(11.3)	17(19.1)	50(56.2)	22(24.7)

**Table 4.** Reliability of expert advice received from Consultant Clinical Microbiologists in relation to user's department and their status and Reliability of expert advice received from Consultant Clinical Microbiologists

Department	Frequency (%)			Total
	Agree	Disagree	Not sure	
O&G	13(68.4)	4(21.1)	2(10.2)	19(100)
Medicine	33(78.6)	3(7.1)	6(14.3)	42(100)
Surgery	17(50.0)	9(28.1)	7(21.9)	32(100)
Pediatrics	14(66.7)	3(14.3)	4(1.8)	21(100)
Others	87(80.6)	12(11.1)	9(8.3)	108(100)
Total	163(73.4)	31(14.0)	28(12.6)	222(100)
<i>Statistics*</i>				
Status				
House officer	73(79.3)	13(14.1)	6(6.5)	92(100)
Registrar	69(72.6)	12(12.6)	14(14.7)	95(100)
Senior Registrar	16(66.7)	5(20.8)	3(12.5)	24(100)
Consultants	5(54.5)	(9.1)	5(45.5)	11(100)
Total	163(73.4)	31(14.0)	28(12.6)	222(100)
<i>Statistics**</i>				

*Statistics\* Pearson Chi-Square = 15.39, df = 8, p = 0.05*

*Statistics\*\* Pearson Chi-Square = 15.35, df = 8, p = 0.02*

## Discussion

Findings from this study reveal that the laboratory users have high level of dissatisfaction with many aspects of the laboratory services surveyed. This is evident in their responses to the cost of laboratory tests, perceived reliability of test results and the turnaround time. This dissatisfaction appeared higher where the number of customers that agreed with the reliability of laboratory results was only 28.1%. The lower level customer satisfaction observed in LTH may be because the hospital has lower staff strength and lesser support in terms of funding, for example, there is only one full time Clinical Microbiologist to liaise with the clinicians and also effectively supervise the quality management of the laboratory.

Poor communication between the laboratories and their users may be another reason for low level of customer satisfaction observed in this study. For instance, the fact that only 5.4% of respondents from LTH agreed that laboratory user's handbook is available suggested that the handbook probably existed, but it was no longer readily available among the users.

The general low level of customer satisfaction observed from the 2 hospitals may be attributable to the general inadequate health workforce and infrastructure in Nigeria where the government spend only 6.4% of its annual budget on health which is far below expectation. The number of Doctors for every 10,000 people in Nigeria is 4 compared to 26.7 and 27.4 in USA and UK respectively <sup>7</sup>.

Turnaround time is a common issue between laboratories and their customers even in developed countries <sup>8,9</sup>. Sometimes turnaround times expected by laboratory customers are not realistic. Hilborne *et al* compared clinician's expectations of turnaround times for haematology and biochemistry specimens with actual turnaround times and found that the clinicians' expectations were often not met. They recommended that there is a need for

pathologists and clinicians to collaborate and establish a mutually acceptable turnaround times which could then be used to audit this aspect of laboratory performance <sup>10</sup>. There is a significant association between the status of responding Doctors and the usefulness of expert advice to patient's care ( $p=0.02$ ). House Officers and Registrars agreed more to the usefulness of expert advice (table 4); this might be because they are the bulk of medical workforce in Nigeria Teaching Hospitals and are likely to make more contact with the patients as well as the laboratory than the more senior doctors.

## Conclusion and Recommendation

In clinical microbiology laboratory, multiple tests and procedures are sometimes used to generate just one test result. Positive and negative quality control samples are sometimes analyzed along with all the tests and procedures deployed in generating this result. But because the results of quality control samples are not reported along with test results, it is not possible for clinicians to appreciate the actual cost as well as the time required to generate a particular test result <sup>11</sup>.

Since most of the customers from both hospitals agreed that expert advice obtained from Clinical Microbiologists are usually helpful, this present an opportunity for the laboratory to foster a closer relationship with its customers in other to make the best out of situation on ground. Laboratories in Nigeria should devise friendly means to make clinicians to appreciate the extent and complexity of quality control measures used in generating test results. Such awareness aids the understanding of the turnaround time required to generate results and provides awareness regarding the actual costs of tests <sup>11</sup>. This awareness will enable Clinicians to be able to convince the patients who are the final consumer of laboratory services to spend more on laboratory tests since Nigeria is a country where 63.3% of the total expenditure on health is currently from the pocket of private individuals <sup>7</sup>.

We recommend improved communication between the laboratory and its customers which can be organized in form of workshops, seminars and clinical meetings.

We will also like to recommend an increase advocacy for more funding of health care services in Nigeria from both government and corporate organizations. It is good that the users have confidence in the usefulness of expert advice obtained from the Clinical Microbiologists; these Consultants must work harder to sustain this confidence and also make the advice easier to obtain.

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