

**CHALLENGES AND PROSPECTS OF STUDYING MEDICAL LABORATORY SCIENCE  
IN A NIGERIAN UNIVERSITY; A PERSPECTIVE**Precious Ojokhue<sup>1</sup> and John Osilumie Dirisu<sup>2\*</sup><sup>1</sup>Department of Medical Microbiology, Faculty of Medical Laboratory Science, Ambrose Alli University, Ekpoma, Nigeria.<sup>2</sup>Department of Virology, UK Health Security Agency, England and Department of Medical Microbiology and Public Health, Faculty of Medical Laboratory Science, Nnamdi Azikiwe University, Nnewi Campus, Nigeria.

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**ABSTRACT**

Medical Laboratory Science (MLS) also known as Clinical Laboratory Science (CLS) or Biomedical Science is a vital field of health. This field of study provides information on health using scientific laboratory analysis to diagnose, treat, monitor and prevent diseases. The professional Bachelor of Medical Laboratory Science programme runs for five (5) years for Unified Tertiary Matriculation Examination (UTME) admission, and four (4) years for direct entry candidates. The study curriculum is divided into three stages; a one year Basic Science usually runs at the Faculty of Natural Sciences. A two year Biomedical Science; run by departmental staff in collaboration with staff of Basic Medical Sciences, College of Medicine. A two year professional course and laboratory posting in Medical Laboratory Science Council of Nigeria (MLSCN) approved Laboratories and Hospital Laboratories. The study curriculum for Bachelor of Medical Laboratory Science (BMLS) five years programme is further divided into two stages; the pre-professional stage and professional stage. There are varying challenges facing the students of Medical Laboratory Science not just in Ambrose Alli University, Ekpoma, but virtually all the Nigeria Universities where the course is studied. Students of Medical Laboratory Science have suffered much neglect manifested in the form of poor regulations of admission, lack of infrastructures, inadequate practical and laboratory posting among others. And these challenges greatly have negative impact on the students learning, leading to improper training of these students to fit into the world of Medical Laboratory Science profession in terms of desirable knowledge and skills. Studying the profession (MLS) might be quite challenging but it is full of beautiful prospects. Medical Laboratory Science is one of the most lucrative courses to study in Nigeria and other countries.

**KEYWORDS:** Ambrose Alli University, Unified Tertiary Matriculation Examination, Bachelor of Medical Laboratory Science, Medical Laboratory Science, Medical Laboratory Science Council of Nigeria, Faculty of Natural Science, Faculty of Medical Laboratory Science.

**INTRODUCTION**

Medical Laboratory Science is the practice involving the analysis of human or animal tissues, body fluids, excretions, production of biologicals, design and fabrication of equipment for the purpose of medical laboratory diagnosis, treatment and research.<sup>[1,2]</sup> This field of study provides information about health using scientific laboratory analysis to diagnose, treat, monitor and prevent diseases.<sup>[3]</sup> The major role of Medical Laboratory Science is to assist practitioners in patient diagnosis and treatment using blood, body fluids and tissues (materials derived from the human body) and in monitoring the progression of a disease or how well the treatment is being responded to.<sup>[3]</sup>

Medical Laboratory Science is a complex field of study comprising a number of disciplines including chemical pathology/clinical chemistry that deals with observation and investigation of biochemical changes in human body using body fluid and excretion to detect and measure the biochemical constituents, haematology and blood group serology which is concerned about the study of blood, its constituents, abnormalities, clothing mechanism of blood and determination of individual blood types and testing for compatibility with donors, histopathology which deals with the study of abnormal or diseased tissues and medical microbiology which is the study of microorganisms (bacteria, virus, parasite and fungi).<sup>[3]</sup> Other areas include biotechnology, molecular biology, forensic science, exfoliative cytology and immunology.<sup>[2]</sup>

With this, Medical Laboratory Science occupies a position of much great importance in the health sector and one can hardly imagine a health sector without Medical Laboratory Science. In Nigeria, Medical Laboratory Science practice is regulated by the Medical Laboratory Science Council of Nigeria (MLSCN), the federal statutory body established by the government of Nigeria by Act 11 of 2003. As such, practitioners are referred to appropriately as Medical Laboratory Scientists.

The profession of Medical Laboratory Science is critically important in patient care, because the laboratory is the area that helps with the diagnosis, treatment options and patient outcome as well as routine preventive medicine<sup>[4]</sup>, as such the laboratory is literally nicknamed the “bedrock of modern medicine”<sup>[2]</sup>.

### **Brief History of Medical Laboratory Science in Nigeria**

Medical Laboratory Science has not been considered a professional field for that long, however laboratory testing dates back to the ancient times as far back as 300BC, but there was no established facility for medical diagnosis until 1896 at John Hopkins Hospital.<sup>[5]</sup> Early physicians in ancient Egypt started the practice of examining patient specimen; the oldest known test on body fluid was done on urine.<sup>[6]</sup> Some of the tests done on urine in ancient times involved pouring the urine on the ground to see if it attracted insects, if it did, patients were diagnosed of boil, appearance of bubbles on the surface of urine specimen was related to kidney disease and chronic illness among others.<sup>[6]</sup> It wasn't until the 20th century that Medical Laboratory Science started to become a permanent unit in the hospital, during this time practitioners began to establish identity as professionals.<sup>[5]</sup>

Medical Laboratory Science started from the developed world specifically from the United Kingdom and United States of America almost concurrently. Following the introduction of Infectious Disease Notification Act in 1889 in the United Kingdom, diagnostic bacteriology became an essential service in the United Kingdom and there was need to develop the needed manpower to provide both clinical and laboratory diagnostic support.<sup>[5]</sup> During World War I, there was shortage in medical staff and this led to recruitment of non-physician Laboratory helpers to fill those empty spot and many of those helpers were women and at the beginning of 20th century, several Laboratory assistants had been recruited and trained specifically to provide technical and clinical support for clinical diagnosis.<sup>[5]</sup>

Early Nigerian Medical Laboratory Science trainees especially those who qualified before 1960 invariably had their training in the United Kingdom and over 99% of the pioneer Medical Laboratory Scientists trained between the late 1940s and 1950s. The Profession Medical Laboratory Science started in Nigeria at same

time of evolution of Medical Laboratory service in the country during colonial rule.<sup>[5]</sup> It all started from the recruitment of school certificate holders (informal errand boys of 1920s) who were initially recruited with the aim of carrying out basic staining, prepare certain solution and basic microscopy and the training was through semi organized evening classes which began in three institutions; General Hospital Lagos, National Veterinary Research Institution (NVRI) in VOM, and Adeoyo General Hospital Ibadan leading to intermediate and final diploma of the Institute of Medical Laboratory Technology of United Kingdom and the post independent Institute of Medical Laboratory Technology of Nigeria in the 1960s and metamorphosed to the current professional Bachelor of Medical Laboratory Science degree program of the 1980s and beyond.<sup>[1,5]</sup> From testing urine to microscopy to molecular testing, the sophistication of diagnostic technique has come a long way and continues to develop at breakneck spread. The history of the laboratory is the story of medicine's evolution from empirical to experimental techniques and proves that the medical laboratory is the true source of medical authority.<sup>[6]</sup>

### **Challenges being faced in studying Medical Laboratory Science**

Medical Laboratory Science learning is practical-oriented and requires practical activities in the laboratory.<sup>[4]</sup> Many at times, adequate and functional laboratories are not readily available for the students to carry out practical learning. This is because experimental methods enable students to verify theories, laws and principles surrounding scientific phenomena. These parameters help the students to build their capacity and interest to attain the goals of learning science. No concept in Medical Laboratory Science should be learnt in abstraction but practically by subjecting such concepts to experiments, testing, observing and verifying problems experimentally.

Facility includes buildings, ground, utilities, and equipment and will typically represent the majority of entity's capital asset.<sup>[7]</sup> School facilities consist of all types of buildings for academic and non-academic activities, equipment for academic and non-academic activities, landscapes, farms and gardens, areas for sports, road and paths, furniture and toilets facilities, lighting, acoustics, storage facilities, parking lots, security, transportation, information and communications technology food service and special facilities for the physical challenged persons.<sup>[8]</sup> Shortage of learning facilities such as lecture hall space, seats and desks, practical equipment and basic reagents among others are all challenges faced by students studying Medical Laboratory Science, and this in a way has contributed to the degradation of their performance. The lack of an accommodating and conducive environment for their learning and academic need has resulted in not just their poor performance but has also made it difficult for students to cope with academic workload. The poor

academic performance of Medical Laboratory Science, which has also become a challenging situation for the academic committee, has wide ranging significance on national development. This is because in this field of study, good academic performance is vital, (theory and practical) because the level of academic success Medical Laboratory Science students achieve from the University has a lot of impact on their professional and personal lives in the future.<sup>[9]</sup>

Strike actions also called labour strike is stoppage of work caused by the mass refusal of employees to work, strike usually takes place in response to employee grievances. Strikes are sometime used to pressure governments to change policies of universities infrastructural development and welfare of both Academic and non-Academic staff union of universities.<sup>[10]</sup> Strikes are often part of a broader social movement taking the form of a campaign of civil resistance undertaken by unions during collective bargaining. Strike consists of workers refusing to attend work and picketing outside the workplace to prevent or dissuade people from working in their place. Incessant strike and closure of schools is a big challenge for students studying Medical Laboratory Science in Ambrose Alli University, this is because it causes irregularity of academic programmes, examination malpractice and cultism among students, certificate racketeering and erosion of the dignity and respect of higher education. Whenever the strike was suspended, most times management is not interested in how much these students have learnt, but more interested in concluding the academic session thereby leaving the students at their own peril as serious revision or teaching would not be done before that semester's examination.<sup>[11]</sup>

The issue of poor regularization of admissions into Medical Laboratory Science departments and the maintenance of adequate standards has been associated with some unpopular policies adopted by the Federal Government of Nigeria to address the inadequacy in the number of admission places in the University system. Medical Laboratory Science is a professional course of study dealing with life matters and as such should be handled with high level of professionalism, starting from the admission stage. Admissions have increased more quickly than the department's (MLS) capacity to finance and accommodate. This has affected the educational delivery, inspection, monitoring and other quality assurance activities. For example, the National Universities Commission report of 2011/2012 showed that most Universities in Nigeria exceed their allotted admission quota.<sup>[12]</sup>

The choice of Medical Laboratory Science as a career is influenced by an individual's perceptions of the career. Individuals who portray the profession negatively or positively influence students' perceptions of the career. In terms of portraying the professional negatively, most departments structure Medical Laboratory Science

profession as inferior to other health profession such that students that do not meet up with the entry requirements from those departments are now admitted to Medical Laboratory Science or those who failed from such departments are dropped down to Medical Laboratory Science giving students the mentality that the profession is an alternative and making those studying it see it as not being unique as others, and even when they go on to study it they tend not to have interest. Generations of science students who choose, or do not choose Medical Laboratory Science as their major in University will do so mainly because of people around them who educate them regarding the profession and the importance of a career in Medical Laboratory Science.<sup>[9]</sup> Medical Laboratory Science is less known to students and the public, and educators may not mention it as a respected career option to future science students.

While studying Medical Laboratory Science might be quite challenging, it is full of beautiful prospects. Medical Laboratory Science is one of the most lucrative courses to study in Nigeria and other countries.<sup>[11]</sup> As a Medical Laboratory Scientist, the landscape is full of different opportunities and benefit. Starting from as early as when one is inducted and given a provisional license. Once inducted and given a provisional license, one is opportune to an internship program with pay for one year. Apart from the pay, the programme provides an opportunity to relearn basic skills and gain experience in management and problem solving.<sup>[13]</sup>

The career outlook also is great. There is a large demand for Medical Laboratory Professionals around the world. According to an earlier study, there is a supply shortfall of approximately 9,200 Medical Laboratory Scientist per year, also the employment of Medical Laboratory Scientists will increase by 16% through the year 2024.<sup>[14]</sup> It was also stated that Medical Laboratory Science has 25% job growth and good job security.<sup>[14]</sup> The diversity of opportunity in this profession is immeasurable, as there are several specialty areas to work in such as clinical chemistry, histopathology, molecular diagnosis, bioinformatics, transfusion science, forensic pathology, exfoliative cytology, medical microbiology and haematology. There is also always opportunity for advancement of education up to doctoral level, just as Medical Laboratory Scientists can teach in higher institutions like universities, polytechnics and monotechnics, just to mention few. Medical Laboratory Scientists are also highly sought for in industry, governance and policy making institutions, where their wealth of experience remains invaluable.

Medical Laboratory Scientists enjoy a professional level salary, can work anywhere in the world, have opportunities to keep learning as technology and medical science is always changing, help physicians make important decisions about their patients treatment (with about 70% of medical decisions being laboratory based), see things beyond the capacity of the naked eyes, know

the condition of the patient even without seeing them, use specialized high technology equipment, saves lives, are unsung heroes behind the scenes on lab coats, the team behind the results that make the difference.

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#### Conflict of interest

The authors declare that there is no conflict of interest.

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