

## **Original Research Article**

### **MALARIA DIAGNOSTIC TESTING AMONG PUBLIC HEALTH PHYSICIANS, NIGERIA**

#### **Abstract**

**Introduction:** Malaria is a major public health problem and is endemic in about 107 countries, including Nigeria. The diagnosis and management of malaria is urgent. Delayed diagnosis and inappropriate treatment are associated with significantly increased morbidity and mortality. A definitive diagnosis should be made promptly by demonstrating the parasite on microscopy of a blood smear or by using a rapid malaria antigen test. It is therefore necessary to know if the Community Health Physicians make a definitive diagnosis before the treatment of Malaria.

**Objective:** To determine the use of malaria diagnostic test. **Methodology:** A cross sectional study was conducted among Public Health physicians who attended the Association of Public Health Physicians National Conference in Ilorin Kwara State Nigeria. The structured questionnaire was filled by all consented physicians and analyzed with Excel and Epi-info.

**Results:** Total number of 200 questionnaires were distributed but 125 (62.5%) responded. Majority of them were females 69(55.7%), Age group 31-40 69(60%), Designation Registrar 38(46.6%). Although majority said their usual diagnosis of patients for malaria were Laboratory test in adults 80.0% and Children 79.5% but in the last diagnosis only 51% in Adults and Children 48% **Conclusion:** The study showed that majority of the physician would have used diagnostic test but the actual practice in the last diagnosis was low. This could be due to the urgency of treatment and delay laboratory results. Laboratory result should be made available and used for diagnosis

**Key words:** Malaria, Diagnostic test, Physicians

**Introduction:** Malaria is endemic in about 107 countries, including Nigeria. The diagnosis and management of malaria is urgent. Malaria is responsible for 60 % outpatient visits to health facilities, 30 % childhood death, 25 % of death in children under one year, 11 % maternal death. *Plasmodium falciparum* accounts for the majority of malaria cases in Nigeria and may be associated with severe and fatal disease [1]. Delayed diagnosis and inappropriate treatment are associated with significantly increased morbidity and mortality.

Classically, malaria presents with fever, rigors, headache and body pains, but the clinical features are non-specific and may be confused with many other diseases. It is difficult even for experienced physicians to make an accurate diagnosis of malaria relying only on clinical signs and symptoms only [2]. For this reason, it is, frequently over-diagnosed in many health facilities on the basis of symptoms alone and as such there is over prescription of anti malarials, especially in endemic areas such as sub-Saharan Africa [3,4]. This also implies that the sensitivity of malaria diagnosis based only on clinical judgement will be quite high while the specificity will be greatly compromised [5].

Considering the fact that malaria is a disease with significant socio-economic impact on countries in the developing world especially in sub-Saharan Africa [4]<sup>4</sup>, it is essential to make an accurate parasitological diagnosis so as to ensure that those suffering from the illness receive appropriate treatment and that anti malarials are not wasted in treating patients who may be suffering from other conditions besides malaria. With this background, WHO recommended that all cases of malaria should be confirmed, either with microscopy which is the gold standard or with Rapid Diagnostic Test. It is only those with parasitological confirmation that should be offered anti malarials.

Laboratory confirmation of malaria before treating such has many advantages as against presumptive treatment; improved patient care in parasite-positive patients, identification of parasite-negative patients in whom another diagnosis must be sought, prevention of unnecessary use of antimalarials there by reducing frequency of adverse effects. Besides these, there will be improved malaria case detection and reporting which will hasten confirmation of treatment failures [3]. They recommended that treatment solely on the basis of clinical suspicion should only be considered when a parasitological diagnosis is not accessible. The recommendation allows children less than five years of age, to be managed using the Integrated Management of Childhood Illness (IMCI) practical algorithms for management of the sick child at the first-level health facilities [3]. A definitive diagnosis should be made promptly by demonstrating the parasite on microscopy of a blood smear or by using a rapid malaria antigen test. It is therefore necessary to know if the Public Health Physicians make a definitive diagnosis before the treatment of Malaria.

**Objective:** To determine the use of malaria diagnostic test by Public Health Physicians.

## **Methodology:**

**Study area/population:** The study was conducted among Public Health physicians who attended the Association of Public Health Physicians of Nigeria National Conference. The questionnaire was filled by all consenting physicians.

**Study design:** A cross sectional study, in which questionnaire were distributed to the Public Health Physicians, information collected

**Data collection:** Data was collected from the respondents by a structured self-administered questionnaire. The questionnaire explored the demographic characteristics of respondents; methods for diagnosis of malaria.

**Data analysis:** Data analysis was done with Microsoft Excel and Epi Info 7.

**Ethical Consideration:** Ethical approval was gotten from the ethical committee of Federal Medical Centre, Umuahia: Assigned number: FMC/QEH/G.596/Vol.10/048

**Results:** Total number of 200 questionnaires were distributed but 125 (62.5%) responded. Majority of them were females 69 (55.7%), Age group 31-40 69 (60%), Designation Registrar 38(46.6%). Although majority said their usual diagnosis of patients for malaria were Laboratory

test in adults 80.0% and Children 79.5% but in the last diagnosis only 51% in Adults and Children 48% were by laboratory tests.

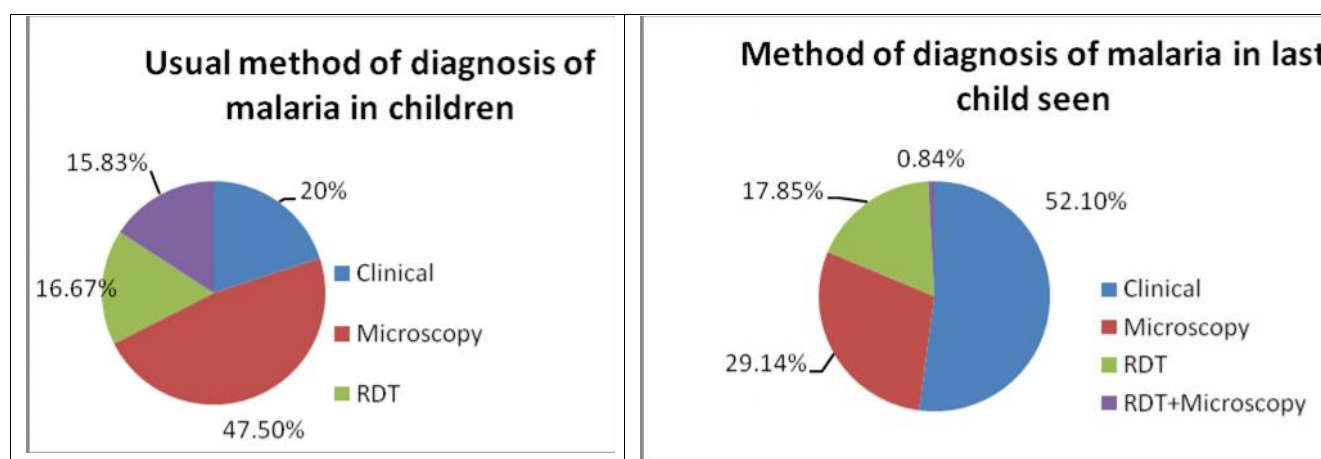
Table 1 Demographic characteristic of the respondents

| Characteristics               | N (%)      |
|-------------------------------|------------|
| Sex                           |            |
| Male                          | 55(44.35)  |
| Female                        | 69(55.65)  |
| Age(years)                    |            |
| 21-30                         | 17(14.78)  |
| 31-40                         | 69(60.00)  |
| 41-50                         | 19(16.52)  |
| 51-60                         | 10( 8.07)  |
| Institution                   |            |
| North-East                    | 0( 0.00)   |
| North-West                    | 8( 7.08)   |
| South-East                    | 12(10.62)  |
| South-West                    | 38(33.63)  |
| South-South                   | 26(23.01)  |
| Middle-Belt                   | 29(25.66)  |
| Designation                   |            |
| General Medical Practitioner  | 7(5.79)    |
| Registrar                     | 56(46.28)  |
| Senior Registrar              | 29(23.97)  |
| Consultant                    | 24(19.83)  |
| Others                        | 5( 4.13)   |
| Work Sector                   |            |
| Public                        | 118(95.16) |
| Private                       | 2( 1.61)   |
| Non-governmental organisation | 4( 3.23)   |
| Location of practice          |            |
| Urban                         | 84(68.29)  |
| Rural and Urban               | 21(17.07)  |
| Rural                         | 18(14.63)  |
| Duration of practice(years)   |            |
| 1-10                          | 81(65.85)  |
| 11-20                         | 31(25.21)  |
| 21-30                         | 10( 8.13)  |
| 30-40                         | 1( 0.81)   |

Number of patients seen per week, mean (std. dev.) = 49(35)

Number of malaria patients seen per week, mean (std. dev.) = 24(23)

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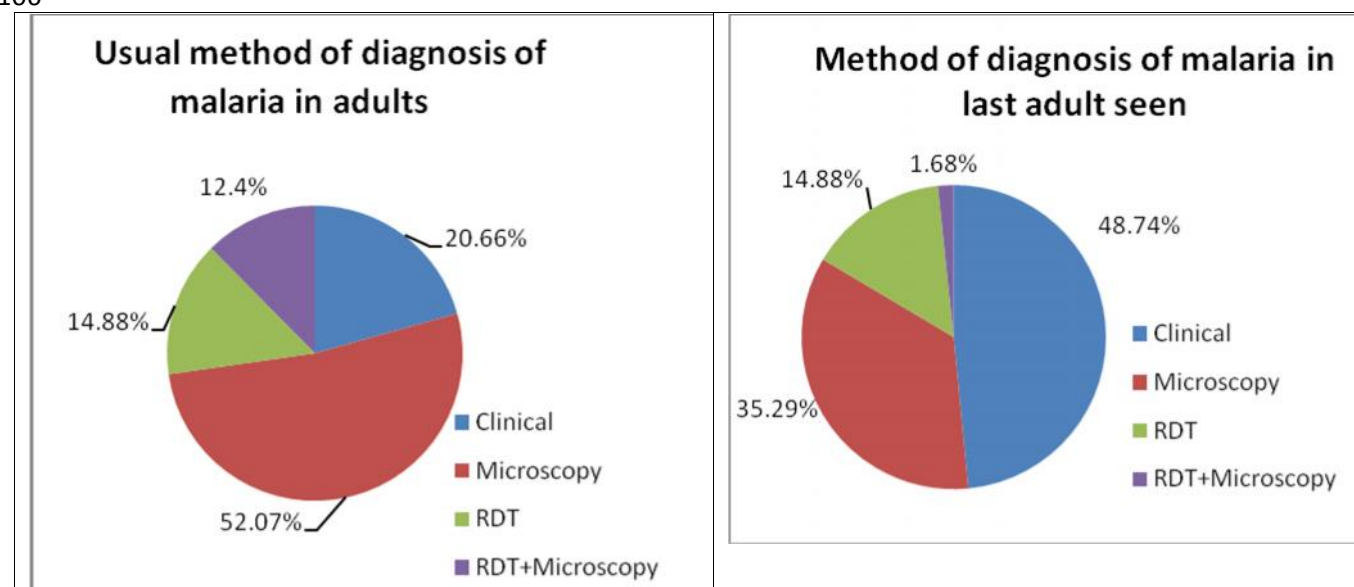
99 Figure 1. Comparison of usual and actual methods of diagnosis of malaria in children

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101 The physicians that said they will usually make laboratory diagnosis with either microscopy or RDT or  
 102 both were 80% while those that actually used it in the last diagnosis were 52%. Those that said what they  
 103 usually use is clinical were 20% while those that actually used it in the last diagnosis were 52%. The  
 104 difference is statistically significant P value < 0.05

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108 Figure2. Comparison of usual and actual methods of diagnosis of malaria in adults

109 In figure 2 the physicians that usually use laboratory diagnosis in adults were 79% while those that used it  
 110 in the last diagnosis were 51%. Those that usually use clinical were 21% while those that used it in their  
 111 last diagnosis were 49%, the difference is statistically significant P value < 0.05

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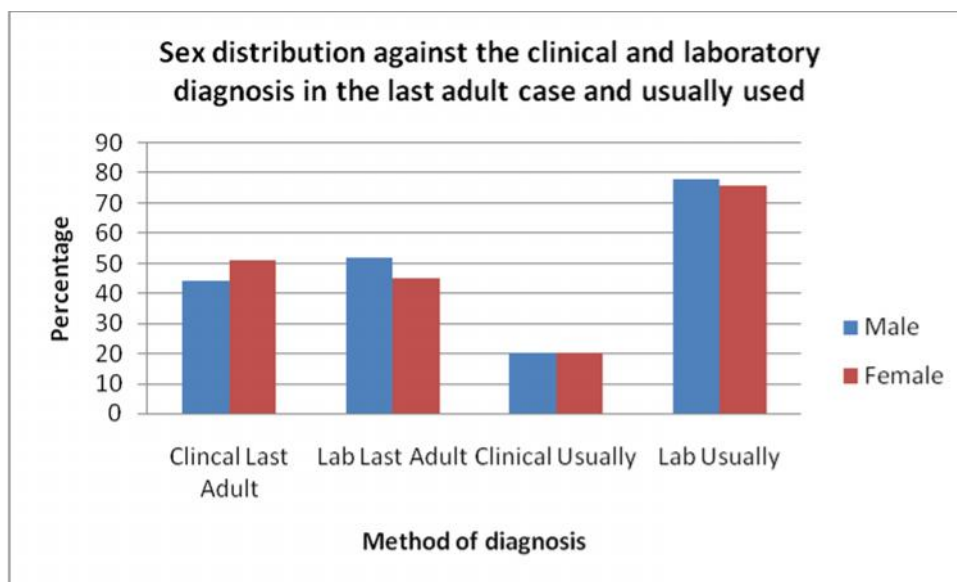


Figure 3 Comparison of sex distribution of physicians and method of diagnosis

More of the females made their diagnosis in last adult case with clinical while males used more of Laboratory diagnosis as infig.3.,The same percentage of males and females indicated that they usually use clinical which is much lower than those that usually use laboratory diagnosis.

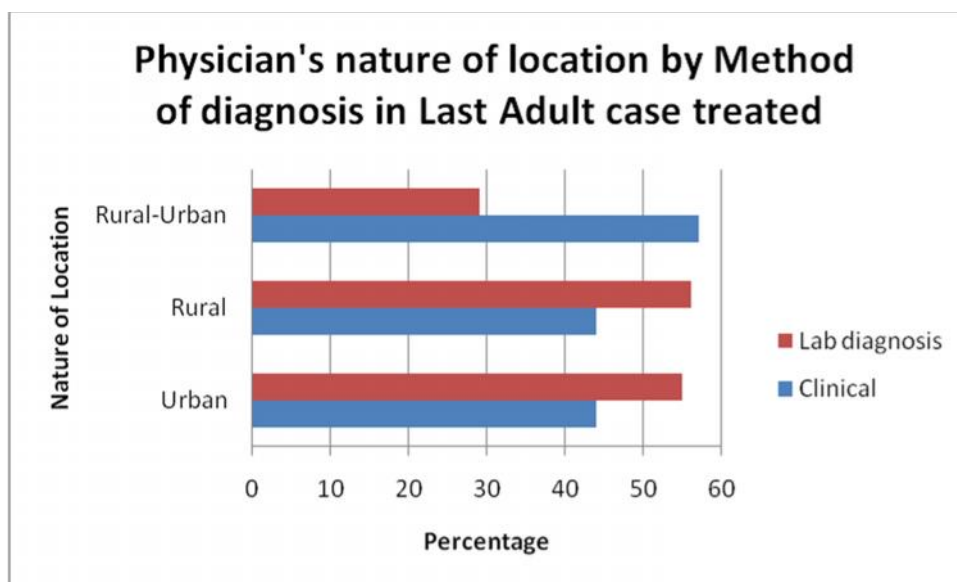


Figure 4 Comparison between physician nature of location and method of diagnosis of Last adult case

The physicians from rural-urban made most of their diagnosis clinically while Rural and Urban used laboratory diagnosis in their last adult case fig.4

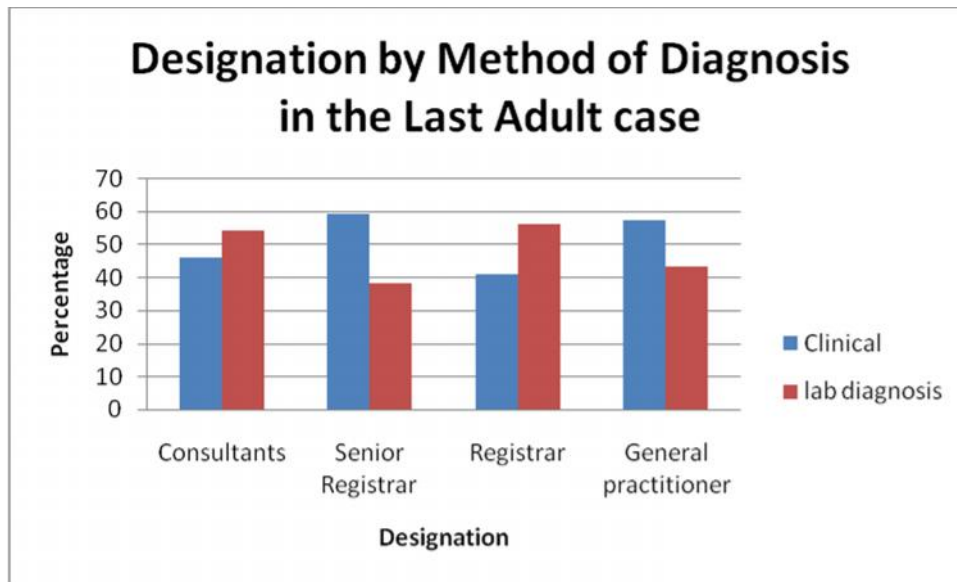


Figure 5: Comparison of Designation of the physicians against method of diagnosis

The consultants and the registrar used more of laboratory diagnosis while Senior Registrar and General Practitioner made their diagnosis of the last adult case more by clinical.

Table 2: Association between selected characteristics of the doctors and method of diagnosis used the last child case seen

| Characteristic    | Method of Diagnosis |           | $\chi^2$ | p-value |
|-------------------|---------------------|-----------|----------|---------|
| Sex               | Laboratory          | Clinical  |          |         |
|                   | n=61(%)             | n=58 (%)  |          |         |
| Male              | 36 (59.0)           | 30 (51.7) | 0.64     | 0.40    |
| Female            | 25 (41.0)           | 28 (48.5) |          |         |
| Age in years      |                     |           |          |         |
| <30               | 6 (9.8)             | 7 (12.1)  | 3.79     | 0.15    |
| 30-39             | 39 (63.9)           | 27 (46.6) |          |         |
| ≥40               | 16 (26.2)           | 24 (41.4) |          |         |
| Years of Practice |                     |           |          |         |
| <10               | 36 (59)             | 28 (48.3) |          |         |

|                      |           |           |       |      |
|----------------------|-----------|-----------|-------|------|
| 10-19                | 17 (27.9) | 24 (45.4) | 2.41  | 0.30 |
| ≥20                  | 9 (13.1)  | 6 (10.3)  |       |      |
| <b>Designation</b>   |           |           |       |      |
| Consultant           | 13 (21.3) | 11 (19.0) |       |      |
| Snr Registrar        | 11 (18.0) | 17 (29.3) | 3.19  | 0.36 |
| Registrar            | 32 (52.5) | 23 (39.7) |       |      |
| Others               | 5 (8.2)   | 7 (12.1)  |       |      |
| <b>Locality</b>      |           |           |       |      |
| Urban                | 46 (75.4) | 38 (65.5) |       |      |
| Rural                | 9 (14.8)  | 8 (13.8)  | 2.75  | 0.35 |
| Both                 | 6 (9.8)   | 12 (20.7) |       |      |
| <b>Facility Type</b> |           |           |       |      |
| Public               | 58 (95.1) | 55 (94.8) | 0.004 | 0.95 |
| Private              | 0 (0.0)   | 2 (3.4)   | df=1  |      |
| Others               | 3 (4.9)   | 1 (1.7)   |       |      |

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138 Table 3: Association between selected characteristics of the doctors and method of diagnosis used the  
139 last adult case seen

| Characteristic | Method of Diagnosis |                 | $\chi^2$ | p-value |
|----------------|---------------------|-----------------|----------|---------|
| Sex            | <b>Laboratory</b>   | <b>Clinical</b> |          |         |
|                | <b>N=57(%)</b>      | <b>N=62 (%)</b> |          |         |
| Male           | 36 (63.2)           | 31 (50.0)       | 2.09     | 0.15    |
| Female         | 21 (36.8)           | 31 (50.0)       |          |         |
| Age in years   |                     |                 |          |         |

|                   |           |           |      |      |
|-------------------|-----------|-----------|------|------|
| <30               | 6 (10.5)  | 7 (11.3)  |      |      |
| 30-39             | 31 (54.4) | 35 (56.5) | 0.11 | 0.95 |
| ≥40               | 20 (35.1) | 20 (32.3) |      |      |
| Years of Practice |           |           |      |      |
| <10               | 30 (52.6) | 34 (54.8) |      |      |
| 10-19             | 18 (31.6) | 23 (37.1) | 1.80 | 0.41 |
| ≥20               | 9 (15.8)  | 5 (8.1)   |      |      |
| Designation       |           |           |      |      |
| Consultant        | 15 (26.3) | 9 (14.5)  |      |      |
| Snr. Registrar    | 11 (19.3) | 17 (27.4) | 3.08 | 0.38 |
|                   | 26 (45.6) | 29 (46.8) |      |      |
| Others            | 5 (8.8)   | 7 (11.3)  |      |      |
| Locality          |           |           |      |      |
| Urban             | 40 (70.2) | 44 (71.0) |      |      |
| Rural             | 10 (7.5)  | 7 (11.3)  | 1.40 | 0.50 |
| Both              | 7 (2.3)   | 11 (17.7) |      |      |
| Facility Type     |           |           |      |      |
| Public            | 54 (94.7) | 59 (95.2) | 0.11 | 0.92 |
| Private           | 3 (0.0)   | 2 (3.2)   | df=1 |      |
| Others            | 3 (5.3)   | 1 (1.6)   |      |      |

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142 **Discussion:** The use of diagnostic test both in adults and children were as signified by those that  
 143 actually used it in the last case seen. This should that about half of public health physicians still  
 144 depend on clinical presentation to make their diagnosis of malaria. In some studies it was lower  
 145 than the outcome of the study like study done in Kenya 19.8% of the children < 5 years were tested  
 146 while 28.7% in ≥ 5 years of age and at the health facilities with the diagnostic test only 33.5%  
 147 and 53.7% were tested in the different age groups[6]. While in Zambia only 27.8% were tested  
 148 out of which 44.6% had positive result.[7] The study done in Malawi showed among Health  
 149 professionals showed that most of the respondents 73.1% use microscopy for diagnosis, 25.6%

used both rapid diagnostic test and microscopy and only 1.2 used only RDT[8] this higher than the result from this study. The study done in Enugu South eastern Nigeria on the use of RDTs showed that RDTs only 31.1% health facilities used it although it was available in 53.3% health facilities and another study in University teaching hospital showed 30% were tested [9,10]. The prospective cohort study done in Uganda to test all reposted cases before treatment showed negative result in 68% of which the quality control showed 6 false negative and 13 (0.8%) that subsequently tested positive[11].

The study showed that although greater percentage said they usually use diagnostic test only few actual used it in the last diagnosis this difference is statistically significant in both children and adults this showed most of the respondents were aware of the use of evidenced based treatment of malaria. This is similar to the study done in Enugu that showed that 61.1% of health care providers were aware of the use of RDTs but the actual use was 31.1% [9].

There was little difference between the use of Diagnostic test among the children and adults in the last case seen. This is similar to the study done in Kenya [6] in which moderate difference was found in the testing rate between the different age group in facilities with the diagnostic test.

The univariate analysis done showed there were no statistical significant difference between the variables among the public health physicians at 0.05 as level of significant, this showed that the method of diagnosis was not dependent on the Sex, Age, Years of practice, Designation, Location of practice and Facility type. This was contrast with the findings of study done in Enugu Nigeria where the use of RDTs was more in the urban area.[9]

**Conclusion:** The study showed that majority of the physicians would have used diagnostic test but the actual practice in the last diagnosis was mainly clinical. This could be due to the urgency of treatment and delay in laboratory results. Laboratory result should be made available and used for diagnosis.

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