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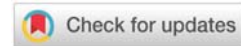
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## Research Article

# Compliance with Rapid Diagnostic Tests (RDTs) and pre-packaged Artemisinin-based Combination Therapy (ACTs) guidelines among pharmaceutical outlets in Port Harcourt, Nigeria

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## Abstract

**Background:** Malaria remains the major public health problem in Nigeria which accounts for more cases of death in Nigeria than in any other country in the world. It also accounts for 60% of outpatient visits and 30% of hospitalizations among children under 5 years of age in Nigeria. The World Health Organization (WHO) recommends malaria to be tested, track prior to treatment using microscopic blood smear or Rapid Diagnostic Test (RDTs). RDTs are performed within the maximum of five minutes which allows for proper diagnosis and treatment of malaria at all level of health care. The aim of this study is to determine the level compliance with Rapid Diagnostic Tests (RDTs) and pre-packaged Artemisinin-based Combination Therapy (ACTs) guidelines among pharmaceutical outlets in Port Harcourt, Nigeria.

**Methods:** A cross-sectional study design was employed in this study, were 163 dispensing officers of pharmaceutical outlets were recruited through the use of simple random sampling technique of balloting. A structured questionnaire was used for data collection after being validated and its reliability tested. P-value less than 0.05 were considered statistically significant.

**Results:** Of the 160 participants, 80(49.1%) were males, while 83(50.1%) were females. Majority 154(94.5%) of them attained tertiary education, while only 5(3.1%) attained secondary education. Hundred and sixty one (98.8%) of the respondents have heard of RDT and are aware of what it means. Furthermore, 159(97.5%) correctly defined RDT as an acronym for Rapid Diagnostic Test. 159(97.5%) indicated that a positive result is characterized by Double line on the strip which reveal high compliance. Malaria rapid diagnostic testing in pharmaceutical outlets have the potentials to target antimalarial drugs more effectively. Association between Educational attainment of respondent and compliance with RDT used were statistically significant (Chi-square=7.4159, fisher's exact=0.039; and Chi-square=10.9651, fisher's exact=0.024 respectively).

**Conclusion:** Pharmaceutical outlets treat malaria but most adhere to the mRDTs and pre-packaged ACTs recommended guidelines while the rest who do not comply opined that signs and symptoms of malaria are easy to recognize hence, they prefer presumptive treatment. There's need for the government to enforce the recommended guidelines to all hence, would help to reduce over-diagnosis of malaria, over-prescription of anti-malarial drugs, drug resistance and invariably the cost of treatment especially if the testing is done appropriately.



## Introduction

Every year an appreciable number of patients die as a result of malaria due to lack of proper diagnosis and treatment. Microscopic examination of blood smear are relatively expensive, patients are often diagnose and treated symptomatically.

World Health Organization estimated that Africans, approximately one half of suspected malaria cases received parasitological confirmation and the number of courses of ACTs exceed the total number of malaria diagnostic test by factor 2, indicating that many patients receive ACTs without confirmatory diagnosis [1]. Malaria being hyper endemic in our society, individuals who exhibit one or two signs and symptoms of malaria tend to patronize drug shops especially pharmaceutical outlets due cost and proximity.

Currently, it is observed that pharmaceutical outlets evaluate diagnosis and treatment based on symptoms which is not in compliance with the WHO recommended guidelines. This has in so many ways resulted to over-diagnosis of malaria, resistance to ACTs and over- prescription of ACTs.

This situation has become alarming as good number of individuals fall victim of this method of treatment. Pharmaceutical outlets are responsible for checking and dispensing of prescription drugs, providing advice on drug selections and usage to other health professional and counseling patients in proper use of drugs especially on dose and dosages. More so, as technology improves on a daily basis, pharmaceutical outlets became a place where residents visit for regular purchase of medication. Therefore, it is on this background that the research have designed this study to determine compliance with RDTs and pre-packaged ACTs guidelines among pharmaceutical outlets in Port-Harcourt, Nigeria.

## Materials and methods

A cross sectional descriptive survey design was used to investigate the compliance with RDTs and pre-packaged ACTs guidelines among pharmaceutical outlets in Port-Harcourt between August 2018 to February 2019.

One hundred and sixty-three (163) dispensing officers out of 326 registered pharmaceutical outlet were randomly selected for the study using balloting.

A Semi structured self administered questionnaire containing open-ended and closed-ended questions were developed and used for data collection. The questionnaire contained relevant information on “compliance with RDTs and pre-packaged ACTs guidelines among pharmaceutical outlets in Port Harcourt, Nigeria” which was built on previously used instrument from similar surveys among pharmaceutical outlets in Nigeria. The questionnaire was divided into six major sections for ease of administration. The sections deal with the following: Social demographic data, awareness, availability, uptake, barriers and compliance with the recommended guidelines for the use of RDTs and pre-packaged ACTs

among pharmaceutical outlets. Confidentiality of information was maintained throughout the study. The completed questionnaire was collated and entered into the computer. The data was analyzed using Statistical Package for Social Science (SPSS) version 21.0 computer software and the results were presented in simple percentages. Bar chart was used to present remarkable information, chi-square test used to determine associated factors to the non-usage of RDTs and ACTs. P-value less than 0.05 were considered statistically significant.

## Result

### Socio-demographic characteristics of the respondents (Table 1)

The table above showed the demographic characteristic of the respondents indicated that majority of the respondents 151(92.6%) were aged 20–29 years. While 12(7.4%) were aged above 30 years. Gender distribution of the respondents indicated that 80(49.1%) were males, while 83(50.1%) were females. With respect to religion 133(81.6%) were Christians, while 30(18.4%) were Islam. Documentation of the level of Education of respondents revealed that majority 154(94.5%) of them attained tertiary education, while only 5(3.1%) attained secondary education.

**Table 1:** Socio-demographic characteristics of the respondents.

Socio-demographic characteristics	Frequency (n =163)	Percentage (%)
<b>Age</b>		
20-29	151	92.6
30-49	10	6.2
50 above	2	1.2
<b>Sex</b>		
male	80	49.1
female	83	50.9
<b>Religion</b>		
Christianity	133	81.6
Islam	30	18.4
<b>Marital status</b>		
single	80	49.1
married	83	50.9
<b>Tribe</b>		
Igbo	68	41.7
Yoruba	51	31.3
Hausa	12	7.4
Others	32	19.6
<b>Level of Education</b>		
primary	2	1.2
secondary	5	3.1
tertiary	154	94.5
non-formal education	2	1.2

### Awareness on RDTs and prepackaged ACTs recommended guideline (Table 2)

Table 2 above showed the respondents awareness on RDTs and prepackaged ACTs recommended guideline. It indicated that 161(98.8%) of the respondents have heard of RDT and are aware of what it means. Furthermore, 159(97.5%) correctly defined RDT as an acronym for Rapid Diagnostic Test. Also 159(97.5%) indicated that a positive result is characterized by Double line on the strip.



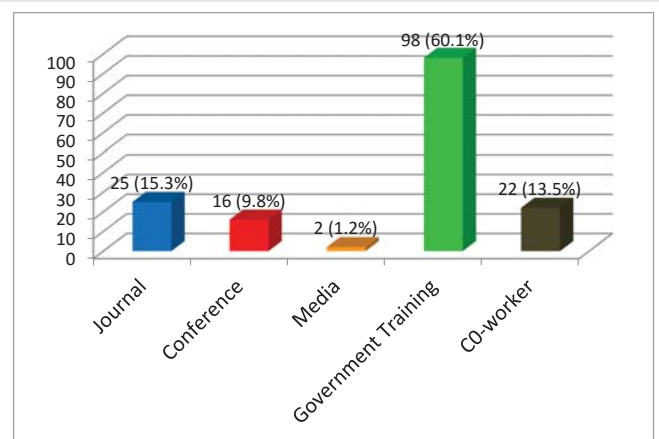
**Table 2:** Information on awareness on RDTs & Prepackaged ACTs recommended guideline.

Awareness on RDTs & Pre Packaged ACTs recommended guideline	Frequency (n = 163)	Percentage (%)
<b>Have you heard of RDT</b>		
Yes	161	98.8
No	2	1.2
<b>Have you heard of prepackaged ACT</b>		
Yes	161	98.8
No	2	1.2
<b>What is the meaning of RDT</b>		
Rapid Disease Test	4	2.5
Rapid Diagnostic Test	159	97.5
<b>What is the meaning of ACT</b>		
Artemisinin-based Combination Therapy	158	96.9
Artemisinin Combination Therapy	5	3.1
<b>RDT positive result is characterized by</b>		
Single line on the strip	4	2.5
Double line on the strip	159	97.5
<b>What treatment is given to RDT positive result</b>		
malaria (ACT) drug	160	98.2
Paracetamol	3	1.8
<b>What treatment is given for RDT negative result</b>		
malaria (ACT) drug	4	2.5
Paracetamol	155	95.1
Flagyl	2	1.2
Others	2	1.2
<b>What are the benefits of RDT</b>		
RDTs are accurate	23	14.1
RDTs are easier to use than other diagnostic method	7	4.3
RDT saves time	6	3.7
All of the above	127	77.9
<b>What are the benefits of ACT</b>		
ACT efficacy high	139	85.3
ACT efficacy moderate	22	13.5
Others	2	1.2

### Availability of the recommended RDTs and pre-packaged ACTs

Information on Availability of the RDTs and ACTs is shown on Table 3 above. It revealed that 155 (95.1%) of the respondents reported that RDTs are available at their pharmacy. Out of the 163 respondents 120(73.6%) said they get their supply of RDTs through government, while 6(3.7%) said through NGOs and 37(22.7%) said through other means. Contrary result was indicated by the report of Olugbenga, et al., [2], who indicated irregular supply of RDT kit in facilities as most of the respondents complained of stock out for the RDTs. However a study by Awoleye and Thorn [3], explained that only availability of RDTs is not enough to sustain adherence to compliance with the WHO recommendation, that it should be combined with effective communication.

In furtherance to that 120(73.6%) reported that they get their ACT drug from government agencies, 2(1.2%) from NGOs



**Figure 1:** Source of information on RDT among the respondents.

The result also revealed that 160(98.2%) of the respondent gave malaria ACT drug once the result of RDT is positive. Also 139(85.3%) said that one of the benefits of ACT is that of its high efficacy in the treatment of malaria. One hundred and twenty seven (77.9%) reported that the benefits of RDTs included giving accurate result, ease of use than other diagnostic methods, it also saves time. This result was similar to that reported by [2], who revealed that the respondents were confident in the results (95.4%) from RDTs, that RDTs would reduce the unnecessary use of ACT (87.2%) and that it gave them more confidence than microscopy results. But this was not in consonance with the work of Colombe et al., where it was reported that many respondents found malaria RDTs of no use. This can also be linked to poor awareness of mRDTs.

Figure 1 below; revealed the source of information on RDT, it indicated that majority 98(60.1%) of the respondents gained their knowledge from trainings organized by the Government. Twenty five (15.3%) reported that their source of knowledge was through journals, 16 (9.8%) reported that their source of information on RDT is through conferences that they attended (Figure 1, Table 3).

**Table 3:** Availability of the recommended RDTs and pre-packaged ACTs among the respondent.

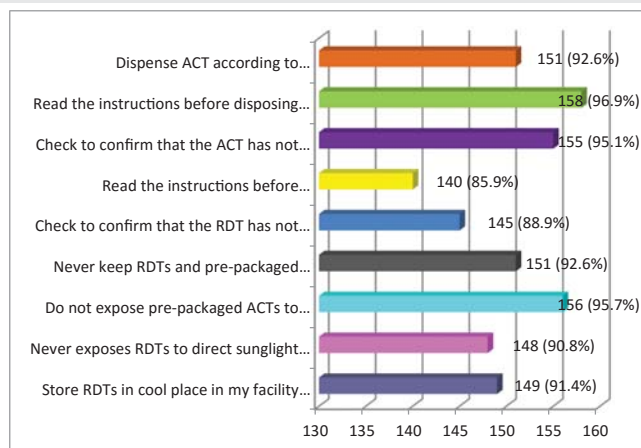
Availability of the recommended RDTs and ACTs	Frequency (n = 163)	Percentage (%)
<b>Do you have RDTs for your pharmacy</b>		
Yes	155	95.1
No	8	4.9
<b>If yes, how do you get RDTs for your pharmacy</b>		
Government	120	73.6
NGO	6	3.7
Others	37	22.7
<b>Do you have ACTs for your pharmacy</b>		
Yes	163	100.0
No	-	-
<b>If yes, how do you get ACTs for your pharmacy</b>		
Government	120	73.6
NGO	2	1.2
Others	41	25.2
<b>What is the ease of RDT procurement</b>		
Easy	163	100.0
Difficult	-	-
<b>What is the ease of ACT procurement</b>		
Easy	163	100.0
Difficult	-	-



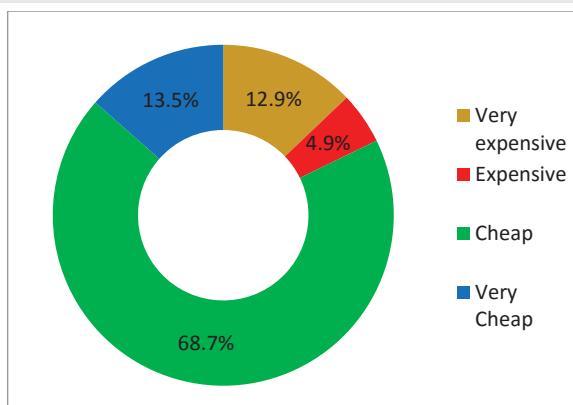
while 41(25.2%) reported other sources. All the participants reported that RDTs and ACTs are easy to procure.

The result also showed that 151(92.6%) complied with dispensing ACT according to recommended dose and dosages. This is as shown in Figure 2 below.

Perception of cost of RDTs revealed that 112(68.7) reported that the RDTs are cheap to purchase, while 21(12.9%) said it's expensive (Figure 3).



**Figure 2:** Compliance with recommended guidelines for RDTs and pre-packaged ACTs use among the respondents.



**Figure 3:** Doughnut chart showing Perception on the cost of RDTs and pre-packaged ACTs among the respondents.

### Association between educational attainments of respondent and compliance with recommended RDTs and ACTs among pharmaceutical outlets in port harcourt

Test of statistical significance for the association between educational attainment of the respondents and compliance with recommended RDTs and ACTs among pharmaceutical outlets in Port Harcourt is documented below. The result indicated that those with tertiary education had 87.7percent compliance rate followed by those who attained secondary education (60.0%), the least was found amongst those with primary (50.0%) and no formal education (50.0%). This was found to be statistically significant ( $Chi-square=7.4159$ ,  $fisher's\ exact=0.039$ ) with those

who attained tertiary having complied most. In a study by Adiel, et al, there result similarly showed that readiness to accept mRDTs was significantly higher among caregivers with formal education compared to those without formal education. Implication of this finding could be said to be as a result of the fact that tertiary education exposes respondents to a wider range of information concerning health issues and awareness. This was also reported in a study by NPC, NMCP, and ICF International were it was indicated that the higher the level of education, the greater the acceptability to health care products such RDTs and Long-Lasting Insecticidal Nets (LLINS) [4-6].

### Conclusion

Pharmaceutical outlets treat malaria but most adhere to the mRDTs and pre-packaged ACTs recommended guidelines while the rest who do not comply opined that signs and symptoms of malaria are easy to recognize hence, they prefer presumptive treatment. This has in so many ways resulted to over-diagnosis of malaria, resistance to ACTs and over- prescription ACTs.

It is unsurprising that despite some understanding about the usefulness of mRDT and the need for parasite-based confirmation of malaria before treatment, some caregivers are still of the opinion that presumptive diagnosis is still better.

The result indicated that most of the facilities have access to RDTs and are knowledgeable on its administration.

### Recommendations

Based on the findings of this study it is recommended

1. There is need to encourage those who complied with mRDTs and pre-packaged ACTs guidelines.
2. There is a need for massive health education to those who do not comply on the importance of mRDTs and use of pre-packaged ACTs guidelines.
3. As long as pharmaceutical outlets are allowed to advice and dispense drugs to patients who come to them for treatment, they should be made to comply to this important WHO guidelines for appropriate management of patients.
4. There is need therefore, to enforce this recommended guidelines to all.

### Author's contributions

Nwankwo OK. conceived the study, designed the questionnaire and performed data collection.

Ebirim CIC performed the statistical analysis, and also contributed in drafting of the manuscript.

Ibe SNO participated in review of related literature and critical review of the manuscript.

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