



Knowledge, Attitudes and Behaviors around Bad Quality Malaria Medicines in Akwa Ibom, Nigeria

Given the importance of the availability and accessibility of good quality drugs in the control of malaria, we assessed respondents' opinion and attitude towards bad quality drugs. The variables assessed include perceptions about the sources and prevalence of counterfeit drugs, understanding of the consequences of bad quality drugs, actions taken to avoid buying bad quality drugs, perceived self-efficacy to detect bad quality drugs and attitudes towards bad quality drugs.

Perceived Prevalence of Bad Quality or Fake Drugs in General

One-third (33.3 percent) of the respondents felt the problem of bad quality or fake drugs was common in their community. This perception was similar between men (33.1 percent) and women (33.4 percent). Bad quality drug was more likely to be perceived as common in Kebbi (40.3 percent) compared to Nasarawa (35.4 percent) and Akwa Ibom (24.1 percent): $X^2=101.3$; $p<0.001$.

Perceived Prevalence of Bad Quality or Fake Antimalarial Drugs

Close to one-third (30.9 percent) of the respondents felt that bad quality or fake malaria medicine was a common problem in their community. Again, the proportion of men (29.6 percent) who felt this way was similar to that of women (31.3 percent). The perception of bad quality malaria medicines as a common problem differed across the states: 23.9 percent in Akwa Ibom, 37.8 percent in Kebbi and 31 percent in Nasarawa ($X^2=72.2$; $p<0.001$). Overall, respondents from urban areas (40.5 percent) were more likely to perceive bad quality antimalarial medicines as a problem compared to their rural counterparts (28 percent): $z = 7.9$; $p<0.001$.

Table 1: Perceived Sources of Bad Quality or Fake Drugs, by State, Nigeria 2014

Perceived Behavior	Akwa Ibom	Kebbi	Nasarawa	All
Government hospitals	5.9%	27.7%	6.6%	13.4%
Government health center	4.5%	9.5%	4.4%	6.1%
Private hospital/clinic	1.9%	7.6%	3.1%	4.2%
Pharmacy	2.2%	9.1%	3.6%	4.9%
Patent Medicine Vendor (PMV)	27.0%	9.3%	17.3%	17.9%
Open market	31.3%	27.9%	36.8%	31.9%
Community health worker	2.6%	5.6%	3.1%	3.9%
Do not know	43.9%	37.7%	36.7%	39.4%

Perceived Sources of Bad Quality or Fake Drugs

Respondents' perceptions about the sources of bad quality/fake drugs are presented and summarized in **Table 1**. Many (39.4 percent) of the respondents reportedly did not know where a person was most likely to obtain such drugs. This lack of knowledge appeared more prevalent in Akwa Ibom than elsewhere. The most common source of bad quality or fake drugs mentioned overall and in each state was the open market. Chemists or PMVs were also commonly cited as sources of fake drugs. In contrast, except for Kebbi State, government health facilities were rarely perceived as sources of bad quality or fake drugs.

Perceived Physical Signs of Good Quality Drugs

About a quarter of the respondents (26.1 percent) said they had no idea how to identify good quality drugs. This

indicator of lack of knowledge was 24.4 percent in Akwa Ibom, 27.8 percent in Kebbi and 26.2 percent in Nasarawa. Furthermore, respondents cited drug effectiveness (49.6 percent) and the presence of National Agency for Food and Drug Administration and Control (NAFDAC) registration (24.5 percent) as the means of identifying good quality drugs.

Perceived Consequences of Bad Quality or Fake Antimalarial Drugs

Most respondents reported associated the following problems with the use of bad quality/fake antimalarial drugs include: lack of effectiveness (53.2 percent), causing death (43.2 percent) and leading to drug resistance (9.5 percent). About one-eighth (13.5 percent) of the respondents reportedly did not know the problems associated with bad quality drugs. More people in Kebbi (18 percent) compared to Akwa Ibom (13 percent) and Nasarawa (9 percent) reportedly did not know the problems of bad quality drugs.

Actions Taken to Obtain Good Quality Antimalarial Drugs

Almost two-thirds (62.5 percent) of the respondents reported that they usually took deliberate actions to ensure that they bought good quality antimalarial drugs. Making deliberate efforts to obtain good quality antimalarial drugs was less common in Kebbi (57.7 percent) than in Akwa Ibom (66.5 percent) or Nasarawa (63.4 percent): $X^2=27.0$; $p<0.001$. However, men (66.2 percent) were more likely to take deliberate actions compared to women (61.2 percent): $z=3.2$; $p<0.01$. When asked about the specific actions they take, the majority (60.9 percent) said they bought their drugs from a doctor or pharmacist. The proportion of respondents who said they would buy their drugs from a doctor or pharmacist differed considerably across states: 40.3 percent in Akwa Ibom, 75.6 percent in Kebbi and 69.1 percent in Nasarawa ($X^2=308.94$; $p<0.001$). One-third (32.6 percent) said they would ensure the drug has a NAFDAC registration number and another 27.9 percent said they would buy from a chemist/patient medicine vendor. The presence of a NAFDAC registration appeared to be more important to the people of Akwa Ibom (59.2 percent) in determining the authenticity of a drug compared to their peers in Kebbi (11.2 percent) or Nasarawa (24.3 percent).

What to Do in Case of Bad Quality or Fake Drugs

When asked what should be done if they got a bad quality drug, the majority of respondents said they would either return the drug to the seller (46.3 percent) or throw it away (40.2 percent). Others said they would report the drugs to NAFDAC (10.6 percent) or talk to a doctor (13.8 percent).

Demonstrated Ability to Read Antimalarial Drug Batch Number

Respondents' ability to differentiate fake from genuine drugs was assessed by showing them a packet of malaria drugs and asking them to read the batch number on the packet. Only about two-fifths (40.4 percent) of the respondents were able to correctly read the batch number. The rest were not able to read at all (42.3 percent) or read the number incorrectly (17.3 percent). As expected, ability to read the batch number was a function of education level, varying from 10.3 percent among those with no formal education to 41.6 percent for those with primary education, 70.1 percent for those with secondary education and 83.3 percent for those with tertiary education. Furthermore, men (48.3 percent) were more likely than women (37.6 percent) to correctly read the batch number: $z = 6.7$; $p<0.001$. Whereas, close to three-quarters (73.2 percent) of the respondents from Akwa Ibom were able to correctly read the batch number, only 31.3 percent in Nasarawa and 16.7 percent in Kebbi did. About one-third of those who reported that they typically check for NAFDAC's registration number as a way to determine the genuineness of drugs were not able to correctly read the batch number.

Perceived Self-Efficacy for Bad Quality or Fake Drugs-Related Actions

Three items were used to assess respondents' perceived self-efficacy to take actions related to bad quality or fake drugs: ability to report sellers of bad quality drugs to the authorities, ability to know if an antimalarial drug was good or bad quality, and ability to avoid buying bad quality drugs.

About half (49.4 percent) of the respondents felt able to report someone who sold bad quality drugs to the authorities. This indicator was significantly higher for men (57.1 percent) compared to women (46.7 percent), in Akwa Ibom (62.0 percent) compared to Kebbi (41.0 percent) or Nasarawa (45.3 percent), and for urban (54.9 percent) compared to rural (47.7 percent) residents. The respondents that did not feel able to report sellers of bad quality or fake drugs to the authorities gave the following reasons: they did not know to whom or where to report it (31.6 percent), they feared reprisal (24.9 percent) or did not know how to report it (18.3 percent), and believed that the authorities would do nothing about it (9.3 percent).

Regarding perceived self-efficacy to recognize good or bad quality drugs, most (62 percent) of the respondents responded in the affirmative. This measure of perceived self-efficacy was higher in Kebbi (65.2 percent) than in Akwa Ibom (61.3 percent) or Nasarawa (56.4 percent). Furthermore, men (64.0 percent) compared to women (60.0 percent) and urban residents (73.0 percent) compared to their rural peers (57.4 percent) were more likely to report this self-efficacy measure.

Perceived self-efficacy to avoid buying bad quality or fake drugs was relatively common with three-quarters (75.3 percent) of the respondents perceiving this type of self-efficacy. However, this perceived self-efficacy was less common in Nasarawa (75.3 percent) than in Akwa Ibom (77.3 percent) or Kebbi (79.8 percent).

Attitudes towards Bad Quality or Fake Drugs

A series of questions were used to assess respondents' attitude concerning bad quality drugs (see **Table 2** below). The questions focused on willingness to pay more for good quality drugs, perceived ease of recognizing bad quality drugs, the consequences for selling bad quality drugs and health implications of bad quality drugs.

The majority of the respondents agreed that bad quality drugs could cause serious health complications, were willing to pay more to get good quality drug and agreed that anyone found selling bad quality drugs should be imprisoned. It is pertinent to note that less than one-third of the respondents believed it was not easy to recognize bad quality drugs, that bad quality or fake drugs were not always different from genuine drugs from the outside, or that bad quality or fake drugs are always cheaper than good quality drugs.

Table 2: Attitudes Concerning Bad Quality or Fake Drugs, Nigeria 2015			
Statement	Agree	Disagree	Don't know
I am willing to pay more money to obtain good quality anti-malarial drugs.	76.6%	17.4%	6.0%
It is easy to recognize bad quality or fake drugs.	56.6%	33.4%	10.1%
Bad quality or fake drugs are always different from genuine drugs from the outside.	57.0%	29.6%	13.4%
Bad quality or fake drugs are always cheaper than good quality drugs.	59.2%	28.9%	11.9%
Anybody found selling bad quality or fake drugs should be imprisoned.	77.2%	15.5%	7.3%
Bad quality or fake drugs can cause serious health complications.	79.0%	13.9%	7.3%
Our government is doing enough to combat the problem of bad quality or fake drugs.	69.2%	17.6%	13.1%

We scored each respondent between -2 and +2 on each of the items depending on whether the responses was in favor of or against fake drugs. We then combined the score to obtain a composite score of attitudes towards fake drugs. The Cronbach's alpha score for the seven items was 0.73. The resulting composite score varied between -13 to +14, with higher scores indicating attitudes that were against fake drugs. The mean score was 2.76 suggesting that attitudes were weakly unfavorable towards fake drugs. Anti-fake drug attitudes were more prevalent in Akwa Ibom (mean score was 3.5) compared to Kebbi (2.8) or Nasarawa (2.0).

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Summary

Overall, one-third of caregivers perceived the problem of fake or bad quality drugs, and antimalarial drugs in particular, to be common in their community. Caregivers from Kebbi were more likely to hold this perception. The perception was also more common in urban than rural areas. Open markets and chemists/PMVs were the most commonly mentioned sources of fake drugs. Interestingly, in Kebbi, more than one-third of caregivers mentioned government health facilities as sources of fake drugs. Nonetheless many people understood that fake drugs could cause complications, including death. It is pertinent to note that the chemist or PMV was the first port of call for obtaining treatment for a child with fever.

About two-thirds of caregivers reported taking deliberate actions to avoid buying bad quality or fake drugs. The specific action taken was mainly to buy medicines from a doctor or a pharmacy. About one-third (mainly from Akwa Ibom) mentioned that they would check for the presence of a NAFDAC registration number. Incidentally, many people who stated that they would check for the presence of NAFDAC's registration number were not able to read a batch number correctly. Perceived self-efficacy for bad quality/fake drug-related actions was moderately high. Although only about half of the caregivers felt capable to report sellers of fake drugs to the authorities, almost two-thirds were confident that they could distinguish between good and bad quality drugs, and about three-quarters were confident they could avoid buying bad quality or fake drugs.

Recommendations

Efforts should focus on strengthening the capacity of the intended population to recognize fake and bad quality drugs, and increasing understanding about the sources of good quality and genuine drugs. The finding that many people who recognize PMVs as the most likely places for obtaining fake or bad quality drugs still patronize such establishments suggests that the convenience of/access to PMVs often overrides the desire or need to obtain good quality drugs. It is important to target PMVs and chemist owners/attendants with messages about the dangers of bad quality and fake drugs, how to recognize such drugs and wholesale sources of genuine and good quality drugs. Furthermore, advocacy towards the Ministry of Health to ensure uninterrupted availability of free or affordable good quality drugs in government health facilities. The population will then need to be sensitized about the availability of such drugs.