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Dear Editor-in-Chief,

Treating children for malaria fever in the face of counterfeit and fake medicines

The World Health Organization (WHO) has defined counterfeit drugs as medicines that are deliberately or fraudulently mislabeled with respect to identity, composition, and /or source. This definition includes completely fake medicines and those that have been tampered with, adulterated, diluted, repackaged, or relabeled so as to misrepresent the dosage, origin, or expiration date. Substandard medicines that are cheaply produced in order to make unlawful profits also constitute counterfeit medicines [1].

Substandard medicines are available in the market worldwide [2] but more prevalent in developing countries than industrialized countries [2, 3]. Substandard medicines have been previously reported in Russia [4] and America [5] but stringent controls by the government were able to nip the situation in the bud. The quality of medicines available in the developing countries has always been in doubt [6]. The reports of treatment failure and drug resistance are abundant in African and Asian countries [7, 8] which have been attributed to the use of counterfeit and fake medicines.

In spite of the efforts of the National Agency for Food and Drug Administration and Control (NAFDAC) to fight sales of counterfeit and fake medicines in Nigeria, the market is still proliferating [9]. A random quality testing of different types of prescribed medicines in Nigerian markets showed that 48% of the samples did not meet the British Pharmacopoeia (BP) standards [10]. Almost 40% of these medicines were manufactured in India. Another study of eight brands of sulphadoxine-pyrimethamine tablets showed that only three brands met all the BP quality specification in spite of their physical and chemical similarities [11].

Malaria is the leading cause of death in children and accounts for over 60% of outpatient visit in Nigeria and other sub-Saharan African countries [12]. It is responsible for 25% infant mortality and 30% of childhood mortality [13]. Malaria usually presents with fever and may explain the frequent use of paracetamol and antimalarials for febrile children. These medicines are frequently adulterated and counterfeited in Nigeria. In addition, they may be substandard when they become chemically

unstable from inappropriate storage and transportation or due to poor quality control during manufacturing. In June 1990, 47 children died from ingestion of paracetamol syrup adulterated with diethylene glycol and in November 2008, another 25 children died and 50 others were hospitalised with severe kidney damage after ingesting "My Pikin Teething Mixture" that had been erroneously tainted with diethylene glycol [14].

Counterfeiting has contributed to resistance of chloroquine and sulphadoxine-pyrimethamine to malaria parasites [15]. Quinine or artemisinin derivatives have been recommended by WHO for severe malaria treatment [16]. Counterfeit quinine is abundant in Cameroon [17] and the fake artemisinin derivatives that dominated the Thai-Cambodian market [18] have gradually spread to some African countries [19]. The potential risk of treating children for malaria with counterfeit and fake artemisinin based antimalarials include clinical aggravation that may lead to progression of acute to severe malaria and even mortality from either the malaria itself or possible toxicity from the substandard components of the medicine, increased cost of treatment to achieve cure, and promotion of early malaria parasites resistance to the medicines. The epidemiologic studies of anti-malarial efficacy is likely to be biased and discordant results between clinical efficacy and molecular markers obtained when ineffective or partially effective counterfeit and fake artemisinin based medicines were administered to patients by the unsuspecting clinician.

The Nigerian government may not alone be able to fight the war against counterfeit and fake medicines; healthcare professionals should blow the whistle by rapidly alerting the relevant authorities as recommended by the WHO [20] when a counterfeit or fake medicine is suspected. Therapeutic drug monitoring should be performed when a patient is not responding to a particular medicine if rationally used. Health care professionals and the general population should be educated by NAFDAC on how to identify genuine medicines from the counterfeits.

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