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The Undercurrents of Fake Drugs Distribution and Sale in Nigeria: a Survey of Onitsha Medicine Dealers, Anambra State.

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Abstract
This paper examines the factors thriving the striving of fake and sub-standard drugs in Nigeria, despite its attendant risks and costs. Concerted efforts of NAFDAC – the regulatory agency – had yielded selective positive results, but the menace is still prevalent, with the agency's staff and laboratories occasionally faced with assassinations and vandalizations respectively. 211 medicine dealers from the famous *Onitsha bridge-head market were probabilistically sampled. The result revealed that besides ignorance and penny-wise-pound-foolish syndrome, there is a weak cohesion between the law enforcement agencies and NAFDAC officers. The paper therefore recommends more vernacular enlightenment, especially in the rural areas, and adequate synergy training programmes for the law enforcement agencies and NAFDAC officers. The need for stiff and dispassionate implementation of extant drug laws is also emphasized.*

Keyword Onitsha, bridge-head, NAFDAC, Fake and Sub-standard Drugs.

Introduction
Pharmaceutical trade in Nigeria has drawn the attention of NAFDAC and other regulatory agencies in the fight against fake drugs and other unwholesome products in the country. According to NAFDAC (2009), Nigeria is a nation whose most pharmaceuticals are imported, chiefly from China and India (Akunyili, 2005). These countries account for approximately 80 percent of Nigeria's pharmaceutical needs. Over the years, these trade relations turned sour due to influx of fake drugs supposedly masterminded by unscrupulous Nigerians and their Indo-Sino partners. Adverse drugs reaction (ADR) became prevalent, with some culminating in death (NAFDAC, 2005).

The devastation caused by the use of fake products varies in scope and scale depending on its range of distribution (Roy and Jeremy, 2009). Of all the different counterfeit goods however, none portends more traversing harm to public health and safety as the pharmaceuticals. The World Health Organization (WHO) estimates that of the one million malaria deaths that occur each year, 200,000 are the result of counterfeit anti-malarial drugs (WHO, 2003), while counterfeit drugs for tuberculosis and malaria kill 700,000 people every year (Harris, Stevens, and Morris (2009).

Although the counterfeit drug trade is wide in scope, it has a more devastating public health effect on developing countries, like Nigeria and other Africa countries, where there are intense demands for inexpensive lifesaving drugs. A counterfeit drug, according to WHO (2009) is one which is deliberately and fraudulently mislabelled with respect to identity and/or source. Counterfeiting can apply to both branded and generic products and counterfeit products may include products with the correct ingredients or with the wrong ingredients, without active ingredients, with insufficient active ingredients or with fake packaging.

However, most of the fake medicines found in Nigerian markets were concocted by persons who do not possess the requisite skills and had not undergone medical training in any accredited institutions (Akunyili, 2002; NAFDAC, 2003). Efforts of the regulatory agency – NAFDAC – to curb the menace of fake and counterfeit drugs are yet to significantly nip it in the bud. Besides the jingle of money (WHO, 2006), poverty and greed are variously implicated too (Nwankwo, 2013).

This paper examines the contextual challenges of fake drugs regulation by focusing on the supply side. It intends to know why NAFDAC's zero-tolerance for fake drugs is still an illusion, from the standpoint of drugs marketers, by hypothesizing thus:

Ho_1: There is no factor that undermines the effort of NAFDAC in combating sub-standard drug marketing in Anambra State.

Ho_2: There is no significant relationship between drug regulatory agencies and law enforcement agencies in combating the menace of sub-standard drug marketing in Anambra State.

The rest of this paper is organized in three key sections of literature review, methodology, analyses and findings/recommendation.

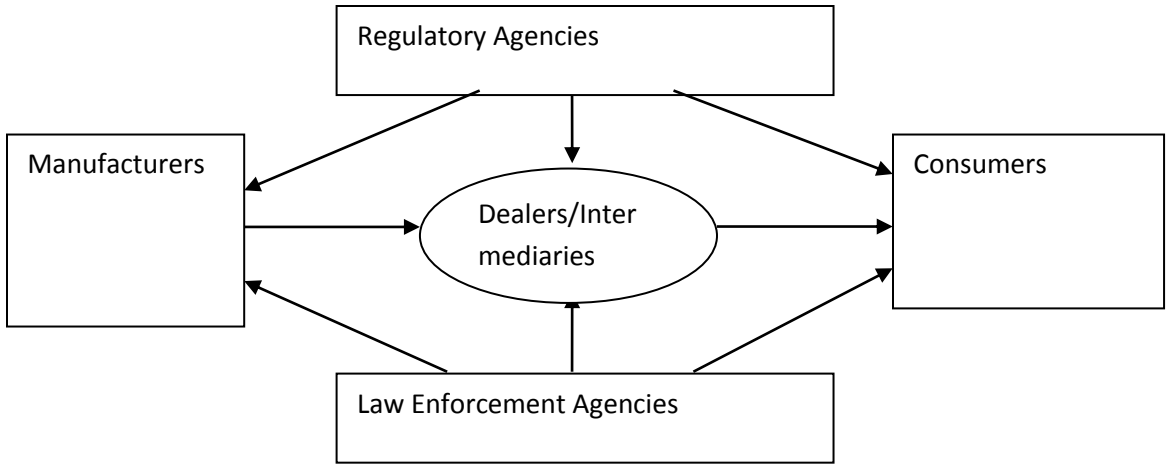
Review of Related Literature

Conceptual Framework

The dynamics of drugs production and marketing is complex. It starts with all manner of relevant inputs which are converted into an output as drugs, through some manufacturing process. The end product is therefore channelled to the end users, again, through a network of dealers and intermediaries. At each point of this whole process, regulation and enforcement are at work to ensure good health and safety of the end users.

For the purpose of this paper, this process is modelled thus:

Figure 1: Conceptual Model for the Study



Source: The authors

Concept of Drugs and Fake Drugs

Drug has different meaning to different people. Scholars from varying fields of study have differing meanings of what a drug is. According to Maira and George (2004), drug could be defined as any chemical substance which when taken into the body or applied externally, has a specific effect on its functioning. To further buttress this, Wikipedia (2013) saw it as a substance which may have medicinal, intoxicating, performance-enhancing or other effects when taken or put into human body or the body of another animal and is not considered as food or exclusively as drug. Drugs come in various forms, and can be taken in numerous ways. Some are legal while others are not. Drugs can be categorized as follows; Stimulants (cocaine, Methamphetamines, Amphetamines, Ritalin, Cylert); Inhalants (Glues, Paint thinner, Gasoline, Laughing gas, Aerosol sprays); Cannabinoids (Hashish, Marijuana); Depressants (Barbiturates, Benzodiazepines, Flunitrazepam, GHB(Gamma-hydroxybutyrate, Alcohol, Mathaqualone, Tranquillisers); Opioids and Morphine Derivatives (Codeine, Heroin, Morphine, Fentanyi and Fentanyl analogs, Opium, Oxycodone HCL, Hydrocodon bitartrate, acetaminophen); Anabolic Steroids (Anadrol, Oxandrin, Durabolin, Stanozol, Dianabol); Hallucinogens (Mescsline, Lysergic acid diethylamide – LSD, Psilocybin, Cannabis, Magic mush rooms).

However, one of the critical threats facing the global pharmaceutical industry and health care is the existence of sub-standard drugs in the market, either manufacturer- or dealer-induced. According to World Health Organisation, the rate of counterfeit drugs in the globe is approximately estimated to fall between 5-8% of the total worldwide trade in pharmaceuticals. A sub-standard drug, is one which is deliberately and fraudulently mislabelled with respect to identity, composition, and/or source (WHO, 2011). This definition of fake or sub-standard encapsulates not only drugs that are completely sub-standard or fake, but also those that have been tampered with, adulterated, diluted, repackaged, or relabelled so as to misrepresent the dosage, origin or expiration date, as well as those counterfeit drugs that are cheaply produced in order to make unlawful profits.

Akunyili (2005) saw sub-standard drug as goods and services in this category of which their consumption is dangerous to the health of humans and have been scandalous of the image of dealers in legitimate business of manufacturing, distributing and administering them genuinely. This definition went further to point out that even the use of these products can be faked. This leads one to believe that the effect of sub-standard drug constitute danger to human health. The activities of these fakers include; the use of names of reputable manufacturer's brands to deceive the consumers, exploiting similarity in appearance between the original preparation and the counterfeit, passing off a company's product for another amongst others. This aspect of the definition leads people to agree that sub-standard drugs as well as their supply sources may be patronized under a mistaken conviction that they were genuine propositions.

Generally, sub-standard means an act that seems genuine but is not. It means a person who tries to deceive by claiming falsely to be or have something (Hornshy, Cowie and Gimson, 2005). However, the cloudy operational strategy of people who are dealers in those nefarious activities have attracted the attention of public policy makers on health matters thus leading to the establishment of dedicated functional body like NAFDAC

Historical Background of NAFDAC

The formation of National Agency for Food and Drug Administration and Control (NAFDAC) came as a result of the adulteration and counterfeit drug incidence of 1989 in Nigeria, where over 150 children died as a result of ingestion of paracetamol syrup containing diethylene glycol (FGN, 1993). The incidents of fake or sub-standard drugs were so numerous in Nigeria at that time that some neighbouring countries officially banned the sale of made-in-Nigeria drugs in their markets (Akunyili, 2002). These factors and others led to the establishment of NAFDAC as a regulatory agency with the sole aim of eliminating counterfeit pharmaceuticals and foods and ensuring food and drug safty.

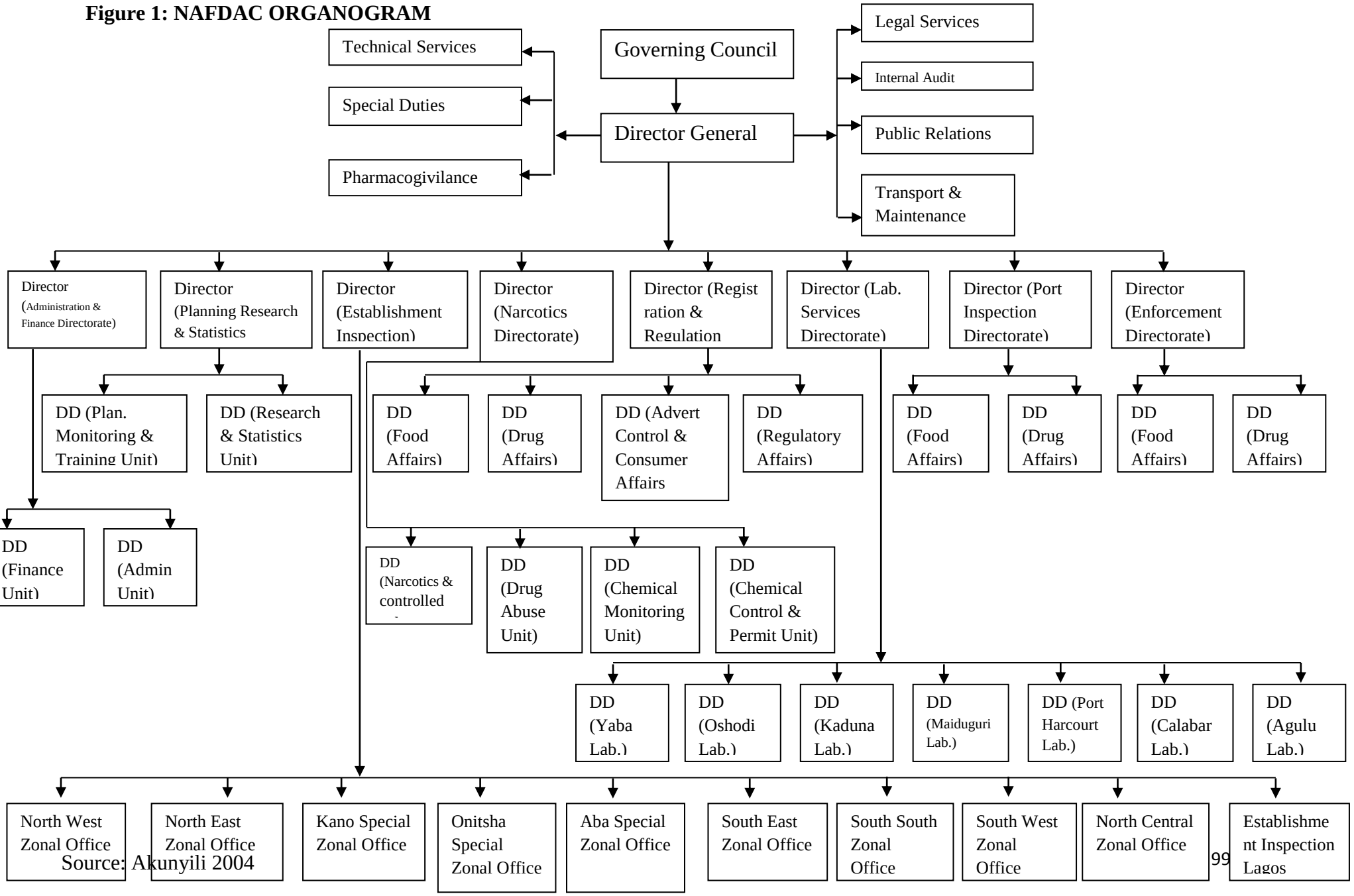
In addition, the formation of NAFDAC was inspired by 1988 World Health Assembly Resolution, requesting countries to help in combating the global health threat posed by counterfeit pharmaceuticals. In December 1992, NAFDAC's first governing council was instituted, chaired by Ambassador Tanimu Saulawa. The enabling legislation followed Decree No. 15 of 1993. On 1st January 1994, NAFDAC was officially established as a parastatal of the Ministry of Health, then called the Directorate of Food and Drug Administration and Control. The Council, whose chairman is appointed by the Federal Government, is peopled by (FGN, 1993):

- The Permanent Secretary of the Ministry of Health.
- The Director-General of NAFDAC
- Standard Organization of Nigeria (SON)
- National Institute of Pharmaceutical Research and Development (NIPRD)
- The Chairman of Pharmacist Council of Nigeria (PCN)
- The Chairman of National Drug Law Enforcement Agency (NDLEA)
- Three people from the general public.
- The Chairman or representative each of the Pharmaceutical group and Food and Beverage.
- Group of the Manufacturers Association of Nigerian (MAN)

Structurally, NAFDAC is divided into eight (8) directorates with the organogram shown in figure 1, thus:

i. Registrations and Regulatory Affairs.
ii. Narcotics (controlled substances)
iii. Planning, Research and Statistics
iv. Finance
v. Administrative Enforcement
vi. Inspectorate
vii. Laboratory service
viii. Port Inspection

Figure 1: NAFDAC ORGANOGRAM



Source: Akunyili 2004

Functions of NAFDAC

The National Agency for Food and Drug Administration and Control (NAFDAC) has various basic functions. According to the requirement of its enabling Act, the agency is authorized to:

- Regulate and control the importation, exportation, manufacturing, advertisement, distribution, sale and use of drugs, cosmetics, medical devices, bottled water and chemicals.
- Conduct appropriate tests and ensure compliance with standard specifications designed and approved by the Council for the effective control of quality food, drugs, cosmetics, medical devices, bottled water and chemicals.
- Undertake appropriate investigation into the production premises and raw materials for foods, drugs, cosmetics, medical devices, bottled water and chemicals, and establish a relevant quality assurance system, including certification of the production site and of the regulated products.
- Undertake inspection of imported foods, drugs, cosmetics, medical devices, bottled water and chemical and also establish a relevant quality assurance system, including certification of the foreign production sites and the regulated products.
- Compile standard specifications, regulations and guidelines for the production, importation, exportation, sales and distribution of food, drugs, cosmetics, medical devices, bottled water and chemicals.
- Control the exportation and issue quality certification of food, drugs, cosmetics, medical devices, bottled water and chemicals intended for exports.
- Undertake the registration of food, drugs, medical devices, bottled water and chemicals.
- Establish and maintain relevant laboratories or other institutions in strategic areas of Nigeria as may be necessary for the performance of its functions.

NAFDAC's sphere of operation covers foods, drugs, cosmetics, medical devices, bottled water and chemicals, instilling extra need for caution and compulsion to respect and obey existing regulations both for healthy living and knowledge of certain sanctions or default. Despite the establishment of NAFDAC, the sale and use of sub-standard drugs and food did not abate (WHO, 2006). A turning-point was however in April 2001, when a new management team was set up, with Dr. Dora Akunyili as the Director-General. The new team re-organised the agency, with acclaimed successes against fakery. Three new policies also emerged (Ratanawijitrasin and Wondemagegnehu, 2002):

i. The outright ban on the importation of drugs and other regulated products through the land borders.
ii. Designation of Calabar and Apapa Seaports as well as the Murtala Mohammed and Malam Aminu Kano International Airports as exclusive Ports of entry for the importation of drugs and pharmaceutical raw materials.
iii. Release of shipping and cargo manifest by the Nigerian Port Authority, shipping lines and airlines to NAFDAC for inspection.

NAFDAC had created international awareness in countries such as China, India, Pakistan, Indonesia, Egypt, Ghana, etc. (NAFDAC, 2012). Furthermore, NAFDAC holds periodic meetings with the ambassadors of countries which they felt are among the country-of-origin of fake drugs or have greater roles to play in fighting the importation of these unwholesome products. Seizures and public destruction of about three billion Naira worth of drugs imported between 2001 and 2002 took place (Inokokong, 2002). Other recorded seizures are N11.6 billion in 2005, N7.6billion in 2006, N6.6billion in 2007, N4.3 billion in 2008 and N5.3 billion in 2009 (Omo, 2012). The treatment meted to nabbed smugglers basically involves prosecution, plus seizure of goods. Imprisonment also awaits convicted culprits.

Some challenges facing NAFDAC range from participation of non-professionals in drug business (Olike, 2008); chaotic drug distribution network (Erhun, Demehin & Erhun, 2005; Akunyili, 2004; Spies & Dusen, 2003; Chika et. al. 2011).); poor implementation of existing drug laws (Okeke, Uzochukwu & Okafor, 2006; NAFDAC, 2005; Ratanawijitrasin, 2002), ignorance (CSFDA, 2006; Olike, 2008), inefficient cooperation between stakeholders (NAFDAC, 2007), illegal drug importation (Akunyili, 2004), corruption and greed (WHO, 2007), high cost of good quality drugs (HAI-Africa, 2008; Global Insight, 2007)) to excessive demand (Erhun et al, 2001).

Review of Relevant Empirical Studies

Several studies have been conducted by researchers on effects of sub-standard drugs (Shakoor, Taylor & Behrens, 1997; Everard, et. al., 2001). For decades now, Nigeria was plagued by counterfeit and poor-quality medicines. In 2002, the World Health Organization reported that 70% of drugs in Nigeria were fake and sub-standard. NAFDAC, on the other hand, estimated it at 41% (Yankus, 2006; Akunyili, 2007). Lewis (2006), Gupta, Gauri & Khemani, (2004) implicated corruption in the healthcare sector for this prevalence; drugs were routinely "leaked" from public facilities into private market, with intellectual property rights poorly enforced. Nigeria ranked 94th out of 115 countries where this law is not imple mented (Property Rights Alliance, 2009). The economic and human costs of fake drugs are incalculable. In 1989, about 150 children died after being administered fake paracetamol drug (Bate et. al. 2008).). Again in 2009, 84 children also died as a result of the administration of "My Pikin syrub". Reports in the Nigerian media suggested that there was growing resistance to common first-line anti-malarial drugs likely driven by both irrational drug use and the prevalence of substandard drugs (Reef, 2008).

However, improvements have been made in the past decade, specifically on the reinvigorated leadership of NAFDAC, under the then Director-General, Dora Akunyili, who improved policing and prosecution of counterfeits. In 2006, the number of substandard and counterfeit medicines circulating in Nigeria's market fell to around 16% and this was attributed to increased enlightenments and Nigerian's perception of the effects of counterfeits. With these, it is pertinent to say that the result of this fight speaks for itself. Three and half years after Dr. Paul Orhii came on board, the incidence of counterfeiting has also reduced drastically. A national survey on quality of medicines using TRUSCAN device was conducted by NAFDAC across the 36 states and the FCT between January 2010 and April 2012. The result of the survey showed that the incidence of counterfeiting to reduced to 6.4%. Another study on the quality of medicines was conducted in Lagos State in May 2012, using same device. The tests carried out on medicines containing anti-malarial, anti-biotics, anti-diabetes and anti-inflammatory properties showed that counterfeiting was at 3.8% in the State, which was significantly less than the national average (Olumuyiwa, 2012). These results in so short a period has drawn the attention of regulatory agencies in Kenya, Burkina Faso and Sierra Leone who have sent people to understudy NAFDAC's success in the use of cutting-edge technologies.

Methodology

This study adopts a descriptive survey design. The area of study is Onitsha, made up of 2 Local Governments; Onitsha South and Onitsha North. Onitsha is the focal point of the study because the city is considered the hub of drugs business in the south-east region of Nigeria. The population of the study includes all the registered drug dealers in the Onitsha bridge-head drugs market, which estimate is 2,106 dealers (PPMDA, 2013). Using the one-tenth rule, 10 percent of these dealers (211) were sampled. The sampling procedure was probabilistic: the comprehensive numbered list of these dealers, as contained in their Secretariat, served as the sample frame. Respondents were therefore randomly selected using a table of random numbers. The selected numbers were then contacted and studied.

A likert-type questionnaire was the research instrument for the primary data collection. The scale ranged from Strongly Agree – SA - (5), Agree – A - (4), Indifferent – I - (3), Disagree – D - (2), to Strongly Disagree – SD - (1). To ensure content validity of instrument, Cronbach Alpha was used. The alpha value for the construct indicated that the constituent items had reasonable internal consistency reliability of 0.84, hence the instrument was considered appropriate for the study (Gliem & Gliem, 2003). Furthermore, descriptive statistics (such as frequencies and percentages) were used to analyse the questionnaire responses while ANOVA and Pearson correlation were utilised for the hypotheses test at 0.05 level of significance.

Presentation of Data

Out of the two hundred and eleven (211) copies of the questionnaire administered, two hundred and nine (209) of them were properly filled, returned and usable. Tables 1 and 2 are the presentation of relevant data from the field study.

Table 1: Analysis on the factors that undermine efforts against sub-standard drug marketing in Onitsha

SN	Variable	SA	A	I	D	SD	Remarks
17	There have been violent attacks on NAFDAC officers in Anambra State	161 (77%)	20 (9.6%)	12 (5.7%)	8 (3.8%)	8 (3.8%)	Agreement
18	Non-prosecution of culprit drug barons encourage fake drug marketing	117 (56%)	86 (41.1%)	6 (2.9%)	-	-	Agreement
19	High level of greed in the country increased the distribution of sub-standard drugs	142 (67.9%)	52 (24.9%)	15 (7.2%)	-	-	Agreement
20	The socio-economic condition of Nigerians (poverty and illiteracy) compels people to buy fake drugs, adjudged cheaper.	65 (31.1%)	56 (26.8%0	11 (5.3%)	40 (19.1%)	37 (17.7%)	Agreement

Source: field survey, 2015

The respondents had convincing opinion that there are factors that negate the fight against sub-standard drugs in Anambra State. The Table above revealed that some violent attacks on NAFDAC officers in Anambra State made them show restraint in the discharge of their duties. Again, non-prosecution of fake drugs barons encourages importers and their key dealers in their nefarious activities in Anambra State. Above all, get-rich-quick had conspired to fuel this illicit business. Furthermore, poverty and literacy levels play a strong role in fake drugs patronage.

Hypothesis One

ANOVA

Factor that undermines the effort of NAFDAC in combating sub-standard drugs marketing.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	298.219	4	74.555	793.651	.000
Within Groups	23.391	204	.094		
Total	321.610	208			

Source: Computation from SPSS 20 Analysis

The significance value (F. sig<.05) indicate group differences. Since the F- value of 793.651 which has a significance of .000 is less than .05 (i.e .000<.05), this shows that the conducted test is significant. Therefore, there are factors that undermine the effort of NAFDAC in combating sub-standard drugs marketing

Table 2: Analysis of the perceived cohesion between NAFDAC and law enforcement agencies in curbing the menace of sub-standard drug distribution

SN	Variable	SA	A	I	D	SD	Remarks
21	NAFDAC and law enforcement agencies work hand in hand	89 (42.6%)	104 (49.8%)	16 (7.7%)	-	-	Agreement
22	The law enforcement agencies committedly work with NAFDAC.	19 (9.1%)	-	6 (2.9%)	70 (33.5%)	114 (54.5%)	Disagreement
23	NAFDAC works hand-in-hand with Drug Dealers Association in reducing the menace of fake drugs in Anambra State	103 (49.3%)	92 (44%)	7 (3.3%)	5 (2.4%)	2 (1%)	Agreement
24	The relationship between regulatory agencies and law enforcement agencies could be better	172 (82.3%)	15 (7.2%)	12 (5.7%)	7 (3.3%)	3 (1.4%)	Agreement

Source: field survey, 2015

The respondents were of the opinion that NAFDAC and law enforcement agencies work hand-in-hand, but dedication to duty of the agencies is not strong. The respondents also observed that both NAFDAC and Drug Dealers Association collaborate in the fight against fake and substandard drugs marketing.

Correlations

		Drug regulatory agencies	Law enforcement agencies
Drug regulatory agencies	Pearson Correlation	1	,445**
	Sig. (2-tailed)		,000
	N	209	209
Law enforcement agencies	Pearson Correlation	,445**	1
	Sig. (2-tailed)	,000	
	N	209	209

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Computation from SPSS 20 Analysis

From the study conducted, the absolute value of the Pearson correlation indicates the strength with the absolute value showing the weakness or stronger relationship or strength of the variables. However, the absolute value of the correlation is .445 with a significant value of .000 indicates that the two variables are significantly related. Therefore, there is significant relationship between drug regulatory agencies and law enforcement agencies in combating the menace of sub-standard drug marketing.

Discussion and Findings

The findings revealed that the efforts made by NAFDAC in eradicating the marketing of sub-standard drugs in Nigeria are quite encouraging, but with some challenges prevalent. These challenges range from violent attacks on dedicated NAFDAC officers by suspected fake drugs cartel, non-diligent prosecution of fake drug suspects, greed in the fake drugs value chain, as well as corruption in the regulatory agencies. Socio-economic condition of Nigerians also poses serious threats to the fight against sub-standard drugs. Other contributing factors affecting NAFDAC in their roles include participation of non-professionals in drug business, chaotic drug distribution network, poor implementation of existing drug laws, ignorance, inefficient cooperation between stakeholders, illegal drug importation, corruption and greed, high cost of good quality drugs (Chika et al, 2011).

To buttress further on this, the hypothesis table revealed that though NAFDAC has fought the marketing of sub-standard drugs in Nigeria with several measures, its success depends on the cooperative effort of Nigerians. This corroborates with the position of Akunyili (2002) and UNDP (2004) that the pivotal role of poverty in sustaining the production and sale of fake drugs can only be met when people's standard of living is improved.

In a similar vein, this study also revealed the existence of collaboration between NAFDAC and law enforcement agencies in Nigeria, as shown in table Two 2. This is in line with WHO (2011) publication that the activities of NAFDAC and other regulatory agencies have been successful owing to their corroborative efforts. This collaboration is however weak and may have accounted for the minimal impact. The support of citizens as stressed by the test hypothesis is vital.

Conclusion and Recommendations

Counterfeiting of drugs and other pharmaceutical is beginning to gain the attention it deserves. This is evidenced by the number of campaigns and programmes organized by NAFDAC and other regulatory agencies within and outside the country. The challenges facing NAFDAC in the combat against fake drugs cannot be controlled or properly handled without the full and continuous support of the Nigeria government, law enforcement

agencies, association of drug dealers and Nigerians. Therefore, relevant government organs should have the courage to dispassionately implement existing drugs laws and punish offenders appropriately. More work still need to be done on symbiotic training between NAFDAC and the law enforcement agencies, with adequate financial assistance especially in areas of staffing, product inspection and quality control laboratories. Nigerians, irrespective of their positions, should understand the effect of illicit drug on human health. Massive enlightenment especially in the rural areas should be embarked on, if the fight against counterfeit drugs is to be won in Nigeria. From the agency in charge of drug control, the government of Nigeria, international communities, drug manufacturers, pharmacists, all sectors, and the health system down to the consuming public should work together and ensure that they report individuals with questionable character in drug business to the appropriate authorities. This will help in the achievement of the regulatory agencies set objective of safeguarding the health of the nation.

Based on the conclusion drawn from findings of this study, the researchers have put forward the following recommendations;

- Training programme especially to enforcement officers in collaboration with law enforcement agencies and other regulatory agencies should be put in place. There should also be a good working environment for staff, as this will increase effectiveness and productivity of the agencies' personnel.

- Tight security at all port of entries in Nigeria should be encouraged in order to curb the activities of illegal drug importers who will not want to go through the process of drug registration. Availability of trained officers and collaboration with other drug agencies can also help.

- There is need for the federal government to have a well-defined drug laws that must be comprehensively implemented by government irrespective of tier or political umbrella. Law makers should, as part of their oversight function, call on NAFDAC and the law enforcement organs to brief them on their success or sore stories periodically on the fight against this unwholesome thriving business.

- Drug offence should be taken more seriously because it involves human lives. Anyone that violates the drug law resulting to death of people should as well receive stiff penalty or life imprisonment as the maximum punishment.

- Manufacturers and dealers should distribute their products only to licensed premises and people, as this will create a better drug distribution channels that can be monitored. The clusters of urban open markets make distribution chaotic and tracking difficult.

- Manufacturers should develop strategy to monitor tightly their products in the legal drug supply chain to ensure that their products are not faked.

- It is discovered that even the ubiquitous patent medicine stores and sheds have the certificate of a contracted pharmacist on display. PSN should begin to unravel the genuineness of the unseen pharmacist-owners of these outlets, whose certification of these outlets for personal pecuniary reasons, have continued to make a mockery of the sanitization efforts of NAFDAC and PSN.

- Consumers' quick and free check on drugs genuineness through interactive mobile phone short messages, by NAFDAC, is very commendable. It is recommended

however that given the poor literacy and low phone-savvy aptitude of a typical rural dweller, further enlightenment on this innovation is apt.

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