

Establishment of criminal/profile DNA database and use of forensic intelligence to combat nationwide insecurity issues in Nigeria.

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Abstract

Criminal activity is on the rise in Nigeria. The nefarious activity of bandits is on the increase with kidnapping of students and attack on farmers. This creates fear in the terrorized communities. Armed robbery as well as rape of citizens going about their normal duties is also on the increase. The road is becoming increasingly unsafe for the citizenry as well as government officials. The government has mandated individuals to register in the National Identification Number NIN which is linked to the Bank Verification Number (BVN) (a database established to curb crime in the banking sector) and the Subscriber Identity module (SIM). The Establishment of such databases is pertinent however the NIN, BVN, SIM-NIN linkage and fingerprints may not be sufficient in solving criminal cases without DNA profiling of convicted individuals, establishment of forensic laboratories and the creation of criminal DNA profile database CRODER – a Criminal offender DNA Exert Repertoire. The role of DNA profiling as an additional measure is to keep a record of all convicted individuals and the CRODER will be an additional useful measure in profiling criminals and individuals can be adopted as a forensic tool in addition to the captured databases of NIN, BVN and NIN-SIM and will be on the watch list of security operatives. The CRODER forensic tool can be done stepwise by availability of an emergency number to dial for emergency, a dispatch personnel to respond to the call, and vigilante groups or other adhoc security officer in the vicinity of the emergency call to get to the vicinity and preserve the crime scene environment for investigators and detectives to work on. CRODER Forensic tool can then be adopted to solve the crime. Offenders trying to escape enroute the airport, can be checked via CRODER and fingerprint compared and matched with the collection in the database. The CRODER may be a necessary stride to bring kidnappers, bandits, and armed robbers to book in record time and curb the rise in criminal activity, insurgency, banditry, and insecurity in general. If properly done, Nigeria will be a haven for citizens and would-be investors.

Keywords: BVN, NIN, CRODER, DNA Profile, Forensic laboratories, Insecurity, Nigeria

Received January 21, 2022; **Revised** May 4, 2022; **Accepted** May 23, 2022

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Journal Homepage: <http://www.bioresearch.com.ng>.
Publisher: **Faculty of Biological Sciences, University of Nigeria, Nsukka, Nigeria.**

Bio-Research Vol.20 No.2 pp.1513-1521 (2022)

INTRODUCTION

The history of the Nigerian nation dates to early settlers in 1100BC who traded across the Middle East and Africa Ancient kingdoms such as the old Oyo empire, Benin Empire, and the Kingdom of Nri. In later years, Nigeria subsequently emerged from a product of an amalgamation between the Northern and Southern protectorates in 1914 by the British colonial leaders. This resulted in a country made up of more than 200 people groups of different extraction (Anjorin, 1967). This ethnic divide has degenerated into various sentimental issues like improper sharing of resources, pollution of water due to oil drilling, and pollution in highly industrialized regions (Achimugu, 2013). These have resulted in militants among the people group fighting for the rights of their own people (Ajibola *et al.*, 2014). Insecurity issues in Nigeria have been linked to other factors such as kidnapping by the militants, banditry activities of insurgents like Boko Haram, unemployment, poverty, armed robbery, poor electricity supply, instability in of the prices of refined petroleum products, religion, leadership failure and finally border porosity leading to an influx of other nationals in Nigeria (Ajibola *et a.l.*, 2014). These problems have given rise to heightened insecurity issues, kidnapping for ransom, and ultimately increase in crime rate with the attendant grave consequences (Ajibola *et al.*, 2014). The government has taken great initiative in the creation of a database to identify citizens via the issuance of a national identity number by National Identity Management Commission (NIMC) which will be linked to SIM (same here) and the bank details BVN (Ogunleye *et al.*, 2017). The early identification of these problems may also involve proactive steps by the Federal government via inputs from the State and local government in the establishment of a database that will readily capture the DNA profile of convicted offenders to be able to identify, pinpoint and rid Nigeria of criminal elements (Roman *et al.*, 2008). The increase in crime rate, insurgency, and kidnapping in Nigeria has been attributed to the gradual loss of moral values due to corruption, inequality in the management of national resources, leadership failure, and border porosity in present-day Nigeria (Ibrahim *et al.*, 2020). The fact that there is an increase in corruption coupled with a high

decline in values due to poverty has resulted in the people having misplaced priority. Corruption has eaten deep into both public and private sectors (Odo, 2015). Values and virtues like honesty, integrity, and diligence are fast giving way to dishonesty, lack of integrity, and the get the rich quick syndrome. Therefore, misplaced emphasis on acquiring wealth through cheap and easy means invariably leads to vices like kidnapping and criminal activity (Okoli *et al.*, 2014). The security issues have resulted in the agitation for Yoruba Nation by people of Yoruba extraction and the call for state's network which led to the establishment and inauguration of the Amotekun on the 9th of January 2020 by the governors in the Southwestern part of Nigeria (International Crisis Group, 2020: 18). The government with its security operatives has consistently tried to curb banditry, terrorism, kidnapping, rape, cultism armed robbery, and insecurity problems for several decades (Okoli *et al.*, 2014). These security issues have been heightened because of human and drug trafficking via porous borders which allow infiltration of illegal persons, arms, and ammunition (Ibrahim *et al.*, 2017). The influx of highly trained Islamic groups like Boko Haram and more recently ISWAP has given rise to complex dynamics in the already complicated security issues (Ibrahim *et al.*, 2017). Insurgent groups have been curbed by our military personnel; they are still out there causing trouble. For example, in 2015, they laid an ambush for people, kidnapping and maiming innocent people in northern and southern federal highways of Nigeria (Ibrahim *et al.*, 2017). The various hideouts include dense forests in the country like Sambisa in the northern region and others in various regions of the country (Oyewole, 2016). The scenario is compounded by the open grazing of herders who migrate from one state to the other in search of open grazing fields for their cows (Inyang *et al.*, 2013). Herdsmen are subsequently used as instruments to carry out their nefarious activities. The untoward effects of all the insurgent groups in Nigeria are exemplified by the abduction of school children in the Dapchi community where 276 girls aged 17-18 years were abducted on the 14th of April 2014 from their school at Government secondary school, Chibok in Borno state. This mode of abduction has also been

reported elsewhere in Kankara in Katsina State and Niger State (Shuaibu *et al.*, 2015).

Growth in the financial sector has been stalled. In addition, the image of the country has been lost, poor development, the nose-diving economy with an increase in the dollar-naira exchange rate, and political instability. This is due to the increase in cybercrimes and ease of money laundering across the globe (Samuel, 2019). The outbreak of the coronavirus pandemic also worsened the economic situation due to the lockdown (Okoli *et al.*, 2014). The BVN registration is a giant stride by the Central Bank of Nigeria (CBN) to secure transactions in the banking sector and to curb financial crime in the banking sector (Ogochukwu, 2019). The essence is to eradicate or minimize fraudulent transactions to the barest minimum. There were unprecedented fraudulent activities in the banking sector in previous years which include money laundering, internet fraud, and illegal Western Union money transactions (Orji, 2014). The CBN and the Federal Government, therefore, put these measures in place to reduce the financial crime rate and enhance financial security in the country. All account holders were mandated, starting from February 2014 till October 2015 to have a bank verification number which is to have a single identity to link all accounts together. Because of these, Bank customers have therefore secured financial milieu to operate and the growing crime rate in the banking sector will subsequently be curbed (Esoimeme, 2015). It is achieved via biometric enrolment which captures physical features that are unique to the individual such as the fingerprint, the head-to-shoulder facial picture amongst others. The Individual accounts in multiple banks can therefore be accessed simultaneously in cases of crime or fraudulent activities. In addition, the individual's data captured will therefore reveal and prevent the situation where individuals whose account is on default due to a loan facility are prevented from doing the same in other banks/banks as banking histories and transactions can be tracked (Ayo *et al.*, 2021). In addition, multiple loans cannot be obtained from banks due to the application of NIN-Sim linkage as well as the BVN. The national identity number is the unique number that identifies a Nigerian citizen from birth, and it is issued by the National Identity Management

Commission (NIMC) after enrolment. It synchronizes demographic, biometric data, banking details, fingerprint, head-to-shoulder facial pictures, and other information about an individual. This information is ultimately linked to the Subscriber Identification Module (SIM) (Mohammed *et al.*, 2017). It will be used ultimately by the Nigerian government for Nigerian citizens to access government social services, opening of bank account and reactivation of a dormant account, consular services at home and abroad, issuance of international passport from the immigration department, drivers' license issuance, and renewal from Federal Road Service Commission (FRSC) as well as vehicle registration (23). There has been indiscriminate sale of SIM cards that were preregistered for nefarious activities. Such nefarious acts include kidnapping, attack, and assault as well as financial crimes and money laundering activities (Ekomwenrenren *et al.*, 2015). This has resulted in increased criminal activities and robbery in society (Ogochukwu, 2019). Prevention of a crime is the best way out and when there is a crime, police can only take a part of the responsibility but not all (Grabosky, 1998). The advent of DNA fingerprinting, wireless communication system, information technology, Geographic information system and closed-circuit camera has changed the scenario drastically.

The accessibility of evidence at a crime scene has been difficult in the Nigerian system due to various reasons for instance the fact that the crime scene is not cordoned off and preserved. The police officers do not arrive the scene until after the public have consciously or unconsciously tampered with the evidence at the crime scene (Roman *et al.*, 2008). The fact that there is no dispatch who responds to emergency calls from the public is the first step in jurisprudence, the jury and judge require evidence-based facts which can be oral testimonies from witnesses, documents, invoices, receipts to support alibi and DNA left at the crime scene (Connors, 1996). The term evidence has been aptly described as any proof, or probative matter legally presented at the trial of any issue, by the parties and through the medium of witnesses, records, documents, exhibits, concrete objects, etc. to induce belief in the mind of the court or jury as to their

contentions (Chambers et al., 2014). The admission of this evidence which is proof of the facts surrounding a criminal case can therefore result in the suspect of a crime being brought to Justice or otherwise discharged (Stein, 2015). The identification or discharge of a suspect is made possible through forensic technology.

Forensic technology is a scientific method of establishment of a connection between the victim and the suspect and such evidence is presented to the judiciary. The method can be adopted in Nigeria in the fight against crime, terrorism, and insecurity. It is an investigative tool used in the identification and analyzing of a crime scene (Travers et al., 1999). The technique adopted in most developed countries of the world uses the deoxyribonucleic acid (DNA) via DNA profiling. Deoxyribonucleic acid or DNA is a molecule that contains the instructions an organism needs to develop, live, and reproduce (Jost, 1999). These instructions are found inside every cell in humans, microorganisms, plants, and animals, and are passed down from parents to their children (Pabo et al., 1984). DNA is made up of molecules called nucleotides. Each nucleotide contains a phosphate group, a sugar group, and a nitrogen base (Travers et al., 1999). The four types of nitrogen bases are adenine (A), thymine (T), guanine (G), and cytosine (C). The order of these bases is what determines DNA's instructions, or genetic code (Travers et al., 1999). Similar to the way the order of letters in the alphabet can be used to form a word, the order of nitrogen bases in a DNA sequence forms genes, which in the language of the cell, tell cells how to make proteins (Travers et al., 1999). Another type of nucleic acid, ribonucleic acid, or RNA translates genetic information from DNA into proteins (Pabo et al., 1984). DNA is a hereditary material present in nearly every cell. Unconsciously, the cells are left everywhere we go therefore it is possible to leave drops of blood, saliva, hair, flakes of skin, semen, and possibly fecal extract in such places (Kamenetskii, 1997). Investigators, detectives, and police depend on these materials left at crime scenes in forensics to link or eliminate an individual or individuals to a crime scene (Williams et al., 2005). DNA profiling otherwise called DNA typing, DNA testing, or genetic/chemical fingerprinting is useful in the

identification of individuals by their profiles. The DNA profile is therefore a determinant in identification via the genetic code (Chambers et al., 2014). It is also used in parental testing in case of disputed paternity (Chambers et al., 2014). The human genome is 99% the same in all individuals hence human DNA sequences are the same in every individual, however interspecies variability in the DNA sequences occur and is used to distinguish one individual from another. The variations can occur in places not known to code for proteins –noncoding regions unless they are monozygotic twins (single zygote divided into two) (Deplancke et al., 2016). DNA profiling uses respective sequences that are highly variable, called variable number tandem repeats (VNTRs), particularly short tandem repeats (STRs) (Udogadi et al., 2020). VNTR loci are very short and similar between closely related humans, but so variable that unrelated individuals are extremely different (Linacre et al., 2014). The use of DNA in profiling individuals to solve criminal cases originates from the work of Sir Alec Jeffreys, a British geneticist who utilized the method of DNA profiling to obtain a genetic fingerprint in research carried out in the Genetics Department of the University of Leicester in England in 1984. Sir A Jeffreys made a startling discovery upon examination of the X-ray film of the DNA of his technician and Family in which similarities and differences were observed. It was a breakthrough, and the discovery was later put in use in 1985 when requested to resolve a dispute which involved a Ghanian Family who are British citizens (Saad, 2015). One of the woman's sons who left Britain for Ghana was denied entry due to possession of a forged passport. Jeffrey resolved the issue when he proved the boy to be the son of the woman after the collection of blood samples from the woman and her other sons (Budowle et al., 1991). He also established the fact that all sons belonged to the same father. The first forensic application of the DNA was used to solve two murder cases involving two teenagers in 1983 and 1986 in Narborough, Leicester respectively. The DNA profile obtained from the semen samples of the victims was used to rule out Richard Buckland who confessed to the crime in custody (Jost, 1999). The crime was later found to be committed by Colin Pitchfork whose blood was sampled six months later

based on a statement from his colleague and found to be a match (Friedman, 1999). The CRODER will serve a purpose like the one that was used in 2015 by Professor Attahiru Jega (former INEC boss) who used the card reader to efficiently manage the national voter's database. The use of the card reader helped to monitor and validate accredited voters, valid and invalid votes and the election story was a success ((Uzodike *et al.*, 2019). No country in the world has been able to fight crime successfully without the use of a DNA database (Alebiosu, 2016). The USA has one of the most robust and effective DNA systems known as the Combined DNA (CODIS) Index System managed by the FBI ((Hares. 2012). It comprises a set of standard DNA Short Tandem Repeat STR (Wyner *et al.*, 2020) of known offenders hence the putative identity of offenders can be provided as evidence when compared with DNA samples from the crime scene (Gail, 2001). It also contains profiles from missing persons, unidentified human remains, and relatives of missing persons (Sample, 2003). There is the Second-Generation multiplex system (SGM) used in the United Kingdom. It has gained acceptance in the scientific and legal community since the 1980s and 1990s and it has been used to identify, confirm, or exonerate suspects in criminal cases such as homicide and sexual assault (Miller, 2003). Majority of high-profile murder cases have remained unsolved for various reasons ranging from unavailability of database profiling that of offenders amongst others. Examples of such cases include the murder case of Dele Giwa, Alfred Rewane, James Kalto, Kudirat Abiola, Bola Ige, Funsho Williams, Eunice Olawale, Marshel Alex Badeh and Dipo Dina. These cases ranged between 1986 and 2010.

DISCUSSION

It has become necessary for the Federal Government to embrace the CRODER to be able to find a lasting solution to the insecurity posed by bandits and insurgents. Such proposal can be presented to the senate for approval and the enactment of the DNA identification and law enforcement Act. This Act will enable samples of DNA to be obtained from individuals convicted of various crimes as well as unidentified human remains. The setup of forensic laboratories in

the six geopolitical zones can be accomplished and formulations of policy guidelines to admit forensic evidence in our Judiciary system will be made possible. It will go a long way in stopping the activities of the insurgents, bandits, and terrorists as well as help in identifying illegal immigrants. The task is daunting however it can be accomplished in stepwise manner. The need for law enforcement agents to liaise with the management of different forensic labs will also help. Emergency number must be put in place and a responder who will dispatch the call to the officer who will get to the incident site. Crime scene investigators who can be adhoc security operatives, Crime scenes must be cordoned from the public and guided such that evidences are preserved. The handling of DNA evidence at crime scenes should not be treated with levity but by law enforcement agents who are adequately trained. Crime scene investigators, homicide detectives or forensic experts. Crime scenes may be site of arson, rape, kidnapping, riot, armed robbery, or bomb blast. The evidence is then transferred to the crime lab, The handling of evidence in any crime scene should follow laid down rules such that the evidence is not destroyed or damaged. This is important as damaged evidence cannot be admissible in the court of law. The next step is the processing of the DNA in which case the STR short tandem repeat PCR. The samples may be blood droplets, hair, rope or cord, saliva or sweat, fingerprints, dried semen, or semen on the victim. Extreme care should be taken to retrieve, package, label, store and preserve the crime scene evidence. The PCR Machine is utilized. The forensic DNA analysis will help via the following ways: It is essential that the government gets trained manpower to handle the laboratory like geneticists, molecular biologists, scientific officers, and adequately trained technologists.

The CRODER developed must be such that it can be categorized as Crime Scene Index CSI, Convicted Offenders Index, Missing Person Index and First offenders Index.

It is highly sensitive at very low concentrations hence minute quantities of DNA can be processed, mixtures of DNA can be analyzed, and profiles can be generated from trace amount of DNA.

The CRODER when established will help in the following ways:

(i). To identify offenders and differentiate from the innocent persons who have been incarcerated wrongly.

(ii) It can link crime scenes together.

(iii). There will be considerable improvement in the judicial system.

CONCLUSION

There is the need for the government to be proactive in the setup of forensic laboratories in the six geopolitical zones of international standard, training of personnel to manage the laboratory and the establishment of CRODER as a means of identification and conviction of offenders. This will go a long way to achieve giant strides in the judicial system and curb terrorism and insurgency. Kidnapping will also be reduced and ultimately eradicated from the society.

Author contributions:

OAA conceived the idea and wrote the manuscript. OAA reviewed the literature in conjunction with OAE and participated in the writing. The manuscript was read and approved by all authors.

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