



**RESEARCH ARTICLE**

**DNA PROFILING AND THE CHALLENGES OF CRIME  
MANAGEMENT IN NIGERIA: THE CASE OF THE NIGERIA  
POLICE FORCE**

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Submitted: March 17, 2019 Revised: July 18, 2019 Accepted: November 11, 2019

**ABSTRACT**

This research investigated DNA profiling and crime management in Nigeria. The major objective of the study was to find out whether the Nigeria Police are aware of how to use DNA optimally as a source of evidence in the investigation process. In Nigeria, the Nigeria Police is one of the leading agencies statutorily charged with the responsibility of providing internal security through fighting of crime. The police does this job by undertaking criminal investigation with a view to collecting evidence to be used for courtroom prosecution of criminal suspects. Since 1930 the Nigeria Police was established, it has relied mainly on the traditional (old school) method of criminal investigations based on eye witness testimonies and statements, the investigators sense of judgment and experience. Overwhelming evidence from this research points to the fact that the said method has proven ineffective, as may unsolved crimes, wrongful prosecution or conviction of innocent criminal suspects and failed courtroom prosecution litter the performance profiles of the Nigeria Police. The study concluded that the capacity level of the Nigeria Police to collect and preserve the DNA evidence as part of the agency's criminal investigation process and use same for courtroom prosecution has significant effect on the effort it makes to fight crime through DNA profiling, and that the availability or non-availability of sophisticated DNA technology in Nigeria has significant effect on the effort the Nigeria police makes to fight crime through DNA profiling. The availability or non-availability of a central DNA database in Nigeria has significant effect on the efforts of the Nigeria police makes to fight crime through DNA profiling.

**Keywords:** DNA; Profiling; Nigeria; Investigation; Nigeria Police Force;  
Crime Management

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### HOW TO CITE:

Nathaniel Nte, U., Daniel Nte, N., Enokie, B.K., & Bienose, O. (2019). DNA Profiling And The Challenges Of Crime Management In Nigeria: The Case Of The Nigeria Police Force. *JILS (Journal of Indonesian Legal Studies)*, 4(2), 188-216. DOI: <https://doi.org/10.15294/jils.v4i2.29446>.

## INTRODUCTION

DNA profiling has attracted a good deal of public attention in the last decade. The practical application of DNA technology to the identification of biological materials has had a significant impact on forensic biology, because it enables much stronger conclusions of identity or non-identity to be made (Roberts, 2015; Ogle, 2014). Indeed, the development and application of DNA profiling has been widely described as the greatest breakthrough in forensic science since fingerprinting (Townley & Ede, 2004).

In DNA profiling and databasing, laboratories directly compare DNA profiles obtained from *biological materials left at crime scenes* with those taken from individuals already charged with involvement in specific serious criminal offences under investigation. However, the subsequent ability to construct digital representation of profiles and store them in continuous searchable computerized databases has made possible a vastly expanded role for DNA profiling in many criminal investigations. In particular, this technology is increasingly applied inceptively rather than reactively. In other words, it shapes an inquiry by identifying potential suspects from the start rather than merely supporting their incrimination or exoneration after they have been nominated for attention by other more traditional, and often very protracted, forms of investigative practice (Roberts, Taupin and Raymond, 2015). In addition, a series of laboratory improvements to enable the reliable extraction of genetic material from a wider range of samples in varying conditions has meant that forensic laboratories can more easily generate DNA profiles to facilitate the investigation and prosecution of a larger number of crime types. Sometimes (as in cold case reviews) such methods may succeed when other forms of forensic or witness evidence has proved insufficient or unreliable in helping bring offenders to justice for crimes committed some years earlier (Jobling & Gill, 2014; Lazer, 2004; Nte, 2012; Onashile, 2009).

Accordingly, policy makers, criminal investigators and legal professionals have been able to depict a series of benefits already derived or potentially derivable from the increasing routine and inexpensive use of this technology and its expanding applications. These benefits include the potential to make speedy and robust suspected offender identifications through automated profile comparisons in centralized criminal justice databases; the ability confidently to eliminate innocent suspects from investigations; the increased likelihood of generating reliable and persuasive evidence for use in court; a reduction in the cost of many investigations; the likely deterrent effect of DNA databasing on potential

criminal offenders; and a possible increase in public confidence in policing and in the wider judicial process (Williams & Johnson, 2016).

However, the spread of forensic DNA profiling and databasing has also prompted a wide range of concerns about problem that may arise from the storage of tissue samples (especially those taken from individuals without his or her consent) and the proliferating uses of genetic information by the police. As a result, in jurisdictions where forensic DNA databases have been introduced, a range of critical commentaries have emerged which have sought to counter claims for the effectiveness of DNA-aided investigations with assertions of potentially problematic ethical and social consequences of their uses. Such commentaries have focused on the threat to the bodily integrity of citizens who are subject to the forced and *nonconsensual sampling of their genetic materials; the intrusion and denigration of privacy rights* caused by the storage and use of tissue samples; the potential for the future misuse of such samples held in state and privately owned laboratories: the prospects of long-term bio-surveillance occasioned by the storage of genetic information in *police database* and *biological samples in forensic laboratories*; and the possibility for the deceptive use of DNA forensic evidence in *police investigations* and *criminal prosecutions* (Billings et al., 2012; Nte, 2011).

Since the early 1990s, legislators across the globe have struggled to balance these two opposing standpoints when deliberating the establishment and permissible uses of DNA databases in their own respective jurisdictions. In doing so, they have been required to address a range of normative questions, including under what circumstances should the police be able to obtain, without consent and with force if necessary, DNA samples from suspects? What range of circumstances and offences should license this sampling?; what agencies should be permitted to carry out the analysis of the samples?; what should be the criteria for the inclusion of DNA profiles on databases?; and what are the legitimate uses of samples and profiles held by the police? Others are from which individuals should samples and profiles be retained following the completion of investigations and for how long should they be held?; who should own, manage, and govern the use of databases accessed by the police?; should access to samples and profiles be permitted to any other organizations?; and what systems should be in place for the quality assurance and oversight of the varying scientific and bureaucratic practices that make up sample analysis, profile construction, storage and comparison? (Williams & Johnson, 2016; Laurie, 2012; O'Neil, 2013).

Van der Westhurzen (2013) suggests that whenever policymakers seek to strike a balance between the potential instructiveness and effectiveness of forensic *DNA profiling* and *databasing*, three important

matters are the focus of attention. The first concerns the legal (and moral) categorization of those individuals deemed legitimate and appropriate 'population' for compulsory DNA sampling, profiling and databasing. The second concerns representations of the nature of the information derived and derivable from DNA samples and forensic DNA profiles. The third is the question of how the permissible uses of such samples and profiles in the course of specific criminal investigations and prosecutions have been established and contested (Technikson, 2015).

The Nigeria Police is charged with the responsibility of maintaining law and order and internal security, especially as they affect protection of lives and property of the entire populace (Oladele, 2006; Nte, 2012). But unfortunately, the effort of the police in curbing crime and protecting lives and property has been quite inadequate, thereby attenuating the confidence of the public in the Police. This aggravated mistrust between the police and members of the Nigerian public adds to the mystery of many unsolved serious criminal offences in the country such as high profile assassinations, armed robbery, kidnapping, and rape (Olashile, 2009).

Over the years, experts have linked the many cases of serious criminal offences that dot the Nigerian criminal justice system to absence of forensic evidence. This forensic gap has rendered justice quite ineffective in the country. The result is a serious dent on the forensic investigative ability of the Nigeria Police and other such security agencies. The identification of criminal suspects is a critical element in forensic investigation. However, it is apparent that obtaining DNA profiles of crime scenes and storing such data in DNA criminal investigation databases with a view to comparing such data with the DNA profiles of crime suspects has the potential of deterring criminals and repeat offenders (Roberts, Taupin & Raymond, 2015). Most unfortunately, however, the Nigeria Police have over the years demonstrated lack of capacity for effective forensic investigation (Olashile, 2009; Nte, 2012).

Olashile (2009) also argued that the police records not based on strong forensic evidence are largely useless as many criminals easily escape detection because names and faces change every day. This situation has created a criminal investigation quagmire in the country. In the light of the foregoing, this study seeks to evaluate the challenges of deploying DNA profiling for forensic investigation by the Nigeria Police as part of discharging its statutory mandate of fighting crime in the country.

Deoxyribonucleic acid (DNA) is a unique genetic data which is more useful and effective than fingerprint data and which could revolutionize Nigeria's crime-fighting efforts. The importance of a proper and effective approach to processing a crime scene for clues should never be taken for granted. Over the past two decades, there have been fundamental changes

in the laboratory examination of physical evidence in the field of forensic investigation. One such technological advancement has been the use of DNA profiling as an investigative tool.

DNA methods are an established part of the Nigerian law enforcement and criminal justice systems. It is hard to believe that the technologies were developed as recently as the mid-1980s, and that the database of law enforcement profiles was established in the 1990s.

In crimes involving DNA, it is possible to obtain a conviction if DNA evidence is acted upon quickly, and if a crime scene is handled in the proper manner. Suspects can be identified from the analysis of DNA, and others eliminated, to narrow down the list. According to one Nigerian Senior Advocate in the High Court, it occurs on an unfortunately frequent basis that courts declare most DNA evidences inadmissible because they are contaminated, or the scene disturbed, or not even preserved, or that there is no proper chain of evidence from the time when (or if) the DNA evidence is collected. A crime scene is the primary source of physical evidence, and that preliminary investigations involve the collection and thorough analysis of evidence before a theory is formulated. DNA evidence that is incorrectly gathered could lose its integrity and/or evidential value, causing this type of physical evidence to be declared inadmissible in criminal proceedings. Alternatively, DNA evidence might not be gathered at all and this could have a detrimental effect on the outcome of the result of a trial. This is one of the problems of this study.

These researchers conducted a preliminary investigation into whether the detectives and crime investigators at the identified police station are aware of how to use DNA optimally for those cases where it can be a source of evidence in the investigation process. The pilot investigation sought to find out the following: how many cases were reported, and how many cases were either solved (convictions obtained), sent to court, and closed as false, withdrawn, filed, or undetected. Results of the investigation showed that the conviction rate in DNA-related cases amounted to three percent—a poor solving rate on the part of the rape statistics and murder statistics in the country. With this low conviction rate, the researcher will prove that there is a problem regarding the investigation of DNA-related cases by the Nigeria police.

The curriculum of the Nigeria Police was also perused with respect to both the detective course and training offered to learner detectives, as well as the comprehensive training in the investigation of DNA-related cases, so that an attempt might be made to improve the ability of investigators to conduct DNA-related investigations. It was found that detectives on the detective courses were given training in the collection and preservation of evidence, however, the department was not at the level

where one could now refer to the detectives completing the course as experts in the field of evidence collection. This is another problem of this study.

Finally, a perusal of previous research efforts on crime fighting in Nigeria shows that much of the efforts of such researchers had focused on use of the non-scientific tools of criminal investigation such as eye witness testimony and statements without any attention paid to forensic aspects of criminal investigation based on DNA profiles. The foregoing no doubt leaves a yawning gap in research that needs to be filled. This constitutes another research problem to this study.

## I. THE RELEVANCE DNA DATABASE FOR SOLVING CRIME IN NIGERIA

As earlier stated, there is no country in the world that can succeed in fighting crime without having in place its own robust, reliable and dynamic DNA database system. For instance, that such country like the USA has been able to deal with the myriad of crime incidents is attributable to its robust sophisticated databases considered to be the best in the world- Combined DNA Index System (COBIS) managed by the FBA (Innocent, 2015; Ugochukwu et al., 2014).

In Nigeria, the agency statutorily charged with the responsibility of providing internal security through crime prevention, crime control, and crime fighting is the Nigeria Police whose origin dates back to 1930 (Ojukwu, 2012; Alemuika, 2014). In the effort to discharge the foregoing responsibility, the said Nigeria Police has been all along relied on the traditional method of criminal investigation (perjoratively referred to as the “old school” method) (Julian, Kelty& Robertson, 2012; Olashile, 2009) which, of course, is based mainly on evidence from eyewitness testimonies and statements as opposed to forensic forms of evidence such as DNA evidence (Nte, 2012; Onashile, 2009). To this extent, the agency relied less on forensics in its criminal investigations.

As consequence of the foregoing coupled with other interrelated factors, the crime wave in the country kept increasing both in the rate of occurrence and forms, including murder, political assassination, armed robbery, kidnapping, terrorism, rape and other forms of sexual assault, arson, burglary, car snatching, and suicide, among other serious offences. Another consequence of the over-dependence on the “old school” method of criminal investigation on the part of the Nigeria Police is the present increase in the number of unsolved crime (Nte, 2012), failed criminal cases

by Police persecutors, and arrest, prosecution or imprisonment of innocent suspects (Onashile, 2009). It is against the backdrop of the foregoing that experts have called for the Nigeria Police and other law enforcement agencies and the criminal justice community in Nigeria to embrace forensic science as is done in other civilized countries (Nte, 2012).

The need for Nigeria to become forensic-compliant can never be over-emphasized. Developing a DNA database will be a step in the right direction. The most important thing needed now is the Federal Government's political will in making forensics a priority in our judicial system. By this, we mean setting up *standard forensic labs*, enhancing *training of forensic experts*, etc. It should be a major focus in enhancing Nigeria's internal security. As enunciated by the US Attorney-General (Innocent, 2015), the following steps are recommended for establishing a robust DNA database for Nigeria:

- i. *A systematic collection of all DNA samples* found at every crimescene, be it *homicide, arson, rape, bomb blast, armed robbery, kidnapping* or even *riot situations* in the country. Personnel trained in sample evidence collection should be tasked with this responsibility. They could be hired or employed forensic scientists, crime scene investigators or specially trained law enforcement agents. This is important because the procedural methods involved in sample evidence collection determine the admissibility of evidence in a competent court of law. If the evidence is not recovered properly, it might get damaged or destroyed. If standard procedures are not followed in recovering, packaging, labeling and storing the evidence before analysis, that evidence might be thrown out by the court and all efforts wasted!
- ii. *Processing of the sample evidence*. This involves the real work in scientifically analyzing the samples to building DNA profiles. The main modern method of analyzing DNA is by using an STR PCR-based equipment. In simple terms, an STR PCR (Short Tandem Repeats Polymerase Chain Reaction) based equipment is a machine that amplifies minutes DNA materials to sufficient quantity enough to develop a genetic profile from.

Since in most cases, samples to be analyzed are usually in very small quantities, such as drops of blood, tiny bubbles of saliva, dried patch of semen, sweat, stains from feet or palms, PCR multiples the extracted DNA into sufficient levels for a profile to be developed (Roberts, 2012). Interestingly, the PCR machine is said to be scarcely available in Nigeria. The Nigerian Forensic Lab that is managed by the Nigerian Police in Lagos does not have a PCR machine. Samples for DNA analysis are sent abroad and may take up

to four weeks for results to return. DNA analysis is not cheap depending on the lab. One can now see the challenges involved in building a DNA database in a developed country like Nigeria. You cannot have a DNA profile bank without DNA equipment. More so, qualified personnel must handle such equipment. These could be geneticists, molecular biologists, trained technologists.

- iii. Very importantly, *computing the developed DNA profiles into a database* can be accessible to only relevant agencies. The database can be in categories such as a Crime Scene Index (CSI), Missing Person Index (MPI), Convicted Offenders Profile (COP) and many other profile categories that can be developed. This will help in distinguishing what category to input into a developed DNA profile. For instance, it took the UK National Offenders Database 40,000 profiles per month to reach 1.2 million samples as at November 2001; that figure would have skyrocketed to over 7 million by now (Roberts, Taupin & Raymond, 2015).

So, how can this challenge be overcome? We suggest the following approach: have at least one standard and functional Forensic lab in every state of the Federation. At worst, one-state-of-the-art forensic lab should be installed in each of the six (6) geo-political zones in the country. These labs will process, analyze and upload to the main database any recovered DNA sample. By so doing and starting immediately, Nigeria would have gotten its first multi-functional and robust DNA Database in one year from now and counting! This will be a milestone.

These labs should not be headed by persons who have neither the concrete nor relevant forensic backgrounds. As a matter of fact, strict standards and international accreditation protocols should be followed in setting up these labs. The set-up should meet international best practices such that they could receive samples from all over the world for analyses. Our labs can be a reference point. This can generate revenue for the Nigerian State. It can increase the quality of our research content and competency to the world, especially the global forensic community (Kazeem, 2016).

The uses and applications of a National DNA database can never be quantified in value. A developed and reliable database will help in (Norswell, 2014):

1. Linking several crime scenes together,

2. Exonerate the innocent (prisons in Nigeria will be decongested for once because many in there are wrongly detained),
3. Identify the potential serial offender,
4. Unraveling clues from cold cases and comprehensively closing the unsolved cases,
5. Identifying the unknown perpetrator from numerous cases of only victims and no suspects,
6. DNA identification is particularly useful when a person has been involved in a fire or vehicle accident or if the body is decomposed. In such circumstances, where other methods are often impossible, DNA can provide means of establishing the identity of the deceased (when a database or recovered sample is available for comparison)
7. Identifying vast number of DNA samples occasioned by mass disasters and mass fatality accidents. Also, studies have shown that escalation of criminal history of an individual can occur. This means that the common thief of today could be the rapist tomorrow or the murderer next year. Statistics in Florida State showed that burglary DNA matches linked to more than 28% of the state's homicide cases and 28% of its sexual assault cases (Innocent, 2015).

## II. AREA OF STUDY: THE NIGERIA POLICE FORCE

The amalgamation of Northern and Southern Nigeria in 1914 was a precursor to the formation of the present Nigeria Police Force on April 1, 1930, with its headquarters in Lagos, commanded by an Inspector-General of Police. Nigerians assumed the overall leadership of the Force in 1964 when the late Louis OrokEdet was appointed the first indigenous Inspector-General of Police (Tamuno, 1970). Since then, thirteen other Nigerians, including the incumbent, Solomon Arase, have been at the helm.

The Nigeria Police Force is a product of the nation's Constitution cited by Alemika and Chukwuma (2000) explicitly prohibited the establishment of the State Police forces other than Nigeria Police Force. Section 214(1) stipulates: "There shall be a Police Force for Nigeria, which shall be known as the Nigeria Police Force, and subject to the provisions of this section, no other police force shall be established for the Federation or any part thereof." Though, the country briefly experimented with local police force at the regional levels alongside the Nigeria Police Force, as enshrined in the Independence constitution of 1960 and the Republican Constitution of 1963 which provided for Local Police Force and the Nigeria Police Force, the military cut short this experiment when it seized power

on January 15, 1966, and dissolved the Local Police Force, as a result of the alleged negative roles attributed to the Force during the First Republic (1960-1966) (Alemika and Chukwuma, 2000).

In essence, The Nigeria Police is a national force and the only one operating throughout the country covering an area of 923,769 square kilometers with an estimated population of over 170 million Nigerians. Thus, by virtue of Section 4, Police Act of 1967, Cap 359 of the Laws of the Federation, 1990, power is conferred upon the Force for the maintenance of law and order throughout the country. The Nigeria Police personnel are estimated at about 377,000 (*The Punch*, February 2, 2015). The Nigeria Police has a centralized management command and control structure in which the Inspector-General of Police singlehandedly determines both policy and operational matters. As the head of the Force, the Inspector-General of Police is appointed by the President but on the advice of the Nigeria Police Council, from among some serving top hierarchy of the Force (NOPRIN, 2007).

According to Alemika and Chukwuma (2000: 8), the Force is organized into 37 Commands and the Force Headquarters. Each of the 36 States and the Federal Capital Territory Abuja is served by a Command of the Force. The Force Headquarters is the office of the Inspector General of Police. The tasks of the Force are carried out through six Departments: Administration and Finance, Operations, Works and Logistics, General Investigation and Intelligence, Training, and Research and Planning. (Johnson, Johnson, and Ifedayo, 2013).

Each of the Departments is under the leadership of Deputy Inspector-General of Police. The 37 State Police Commands are further organized into twelve Zonal Commands. The Zonal commands are under the command of Assistant Inspectors-General, while Commissioners of Police are in charge of State Commands. The entire Force is under the command of the Inspector-General of Police. The Commandants of the Police Staff College, Jos and Police Academy Wudil, Kano are also Assistant Inspectors-General of Police, while the Police Colleges are commanded by commissioners of Police, and the Police Training Schools where recruits are trained are under the direction of Superintendents of Police.

However, for effective national policing and operational command, the zonal command structure was created. The country is divided into the following twelve zones: Zone One is made up of Kano, Jigawa and Katsina States, with headquarters in Kano. Zone Two has Lagos and Ogun States; its headquarters is in Lagos. Zone Three has its headquarters in Makurdi; it is made up of Benue, Nasarrawa and Plateau States. Zone Five comprises Edo, Delta and Bayelsa States; its headquarters is located in Benin. Zone Six

comprises Rivers, Cross River, Akwa-Ibom and Ebonyi States; Calabar is where its headquarters is located. Zone Seven has its headquarters in Abuja and is made up of Federal Capital Territory, Kaduna and Niger States. Zone Eight has Kogi, Ekiti and Kwara States; its headquarters is in Lokoja. Zone Nine's headquarters is in Umuahia and is made up of Imo, Abia, Anambra and Enugu States. Zone Ten with headquarters in Sokoto; is made up of Sokoto, Kebbi and Zamfara States. Zone Eleven comprises Oyo, Osun and Ondo States; Oshogbo is its headquarters. Zone Twelve has Bauchi, Borno and Yobe States; Bauchi is its headquarters. In the same vein, the State Commands are divided into a number of Police Areas and Divisions under the command of Assistant Commissioners of Police who oversee Police Stations and Police Posts within their respective Areas or Divisions (Johnson, Johnson, and Ifedayo, 2013: 1-2).

### A. Objectives of The Study

1. To find out the effect of the capacity level of the Nigeria Police to collect and preserve forensic-DNA evidence as an investigative tool and use same for courtroom prosecution on the efforts by the agency at fighting crime in the country using DNA profiling.
2. To investigate the effect of the availability or non-availability of adequate DNA technology and infrastructure in Nigeria on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.
3. To assess the effect of availability or non-availability of a central DNA database in Nigeria on the efforts by the Nigeria police at fighting crime in the country using DNA profiling.

### B. Research Questions

1. What is the effect of the capacity level of the Nigeria Police to collect and preserve forensic-DNA evidence as an investigative tool and use same for courtroom prosecution on the efforts by the agency at fighting crime in the country using DNA profiling?
2. What is the effect of the availability or non-availability of adequate DNA technology and infrastructure in Nigeria on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling?
3. What is the effect of the availability a central DNA database in Nigeria on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling?

### C. Research Hypotheses

1. The capacity level of the Nigeria Police to collect and preserve forensic-DNA evidence as an investigative tool and use same for courtroom prosecution of criminal suspects has no significant effect on the agency's efforts at fighting crime in the country using DNA profiling.
2. Availability or non-availability of adequate DNA technology and infrastructure in Nigeria has no significant effect on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.
3. Availability or non-availability of a central DNA database in Nigeria has no significant effect on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.

## III. RESEARCH METHODOLOGY

### A. Design of the Study

The design of this study is descriptive research of the sample survey type. This is because the study is descriptive and not experimental in form. Survey research focuses on people and their perceptions, opinions, beliefs, attitudes, motivations and behavior (Osuala, 1982). The type of survey research used is sample survey. Sample survey gathers data and information from a percentage of the population to represent the entire population (Tull and Albaum, 1973; Uzoagulu, 1998).

### B. Population for the Study

The population for this study was drawn from the Enugu State Police Command, Enugu. The command has six departments as follows: Administration & Finance, Operations, Works & Logistics, General Investigations & Intelligence, Training, and Research & Planning. The population strength of the Command as at the time of this study is 3,451.

Table 1 Distribution of Population for the Study by Sample Units

S/NO.	SAMPLE UNITS	NO.	%
1	Operations.	1,377	39.9
2	General Investigations and Intelligence	566	16.4
3	Works & Logistics	521	15.1
4	Admin & Finance	359	10.4

5	Training	338	9.8
6	Research & Planning	290	8.4
TOTAL		3,451	100.0

Source: Field Survey, 2019.

### C. Sample Size Determination

From the population for the study, as mentioned in 3.1 above, an appropriate sample size was determined. This is done by use of a special formula developed by YaroYamanne. The formula is given by:

$$n = \frac{N}{1+(Ne^2)}$$

where,

n = sample size

N = Population for the study

e = level of significance (5% or 0.05).

Substituting in the formula,

$$\begin{aligned} n &= \frac{3,451}{1+(3,451 \times 0.05^2)} \\ &= \frac{3,451}{1+(3,451 \times 0.0025)} \\ &= \frac{3451}{1+8.6275} \\ &= \frac{3451}{9.6275} \\ &= 358.45235 \\ &= 359 \end{aligned}$$

This means, therefore, that the sample size for the study is 359

Table 2 Distribution of Sample Size and Questionnaire by Sample Units

S/NO.	SAMPLE UNIT	NO.	%
1	Operations	144	39.9
2	General Investigations & Intelligence	59	16.4
3	Works & Logistics	54	15.1
4	Admin. & Finance	37	10.4
5	Training	350	9.8
6	Research & Planning	30	8.4
TOTAL		359	100.0

Source: Field Survey, 2019.

#### D. Research Instrument and Method of Administration

The major research tool used for this study was structured questionnaire. In the said questionnaire, the respondents were asked to indicate their preferred responses to the 15 close-ended items by ticking “√” or marking “X” in the boxes provided against each item as follows: Strongly Agree (SA), Agree (A), Undecided (UD), Strongly Disagree (SD), and Disagree (D). The 5-point Likert-type scale was applied in coding of the questionnaire as follows: Strongly Disagree – 1, Disagree – 2, Undecided (UD) – 3, Agree (A) – 4, and Strongly Agree (SA) – 5.

It is worthy to note that the items in the questionnaire are finally settled for after a pilot study was successfully carried out by the present researcher on randomly selected 9 target respondents at the three sample units in the Enugu State Police Command Headquarters Enugu.

The procedure for data collection involved a number of trips to the sample units for the study. The purpose was to contact the target respondents. At the 6 sample units that make up the population for the study, the copies of questionnaires were self-administered to the respondents. Self-administration was preferred here to the postal or mail method because of the unreliability of the latter, particularly in Nigeria where a good number of copies of questionnaire are likely to get lost in transit or may take more time than necessary to either reach the target respondents or come back to the researcher. At the 6 sample units, the questionnaire was distributed to the target respondents in accordance with the number of target respondents that make up each sample unit as contained in section 3.3 above.

## E. Method of Data Analysis

The data collected for this study were analyzed by use of descriptive statistics and inferential statistics. Descriptive statistics used involved use of frequencies, percentages and tables. Inferential statistics used was Pearson's Chi-Square Cross tabulation statistics. The formula for the Chi-Square is given by the following formula:

$$X^2 = \frac{\Sigma(O-E)^2}{E}$$

where,

$\bar{X}$  = calculated Chi-Square value

$\Sigma$  = Zigma (i.e. sum of)

O = Observed frequency.

E = Expected or theoretical frequency

Note: E =  $\frac{(\text{row total})(\text{Column total})}{\text{Grand total}}$

It was the said Pearson's Chi-Square Cross Tabulation Statistics that was used in testing the three hypotheses earlier on put forward in Chapter One of this study at 0.05 level of significance or alpha level. Note also that all the computations were done by use of special computer software known as Statistical Package for Social Sciences (SPSS) known as E-views7.0

## PRESENTATION AND ANALYSIS OF DATA

In this section, the primary data collected in the course of field survey aspect of the mythology of adopted by this study are presented and analyzed. Also in this chapter and as part of the said analysis, the three hypotheses earlier on put forward in chapter one of this report are tested by use of appropriate statistical tool as also earlier stated in chapter three above.

### I. RETURN RATE OF QUESTIONNAIRE

In this section, the return rate of the 359 copies of questionnaires which were administered on the target respondents at the state police headquarters, Enugu are presented and analyzed below.

Table 4 Return Rate of Questionnaire

S/No	Sample unit	No Distributed		No Returned		No not Returned		No Rejected	
		No	%	No	%	No	%	No	%
1	Operations	144	39.9	141	39.3	2	0.6	1	0.3
2	General Investigations and Intelligence	59	16.4	59	16.4	-	-	-	-
3	Works and Logistics	54	15.2	51	14.2	2	0.6	1	0.3
4	Admin. and Finance	37	10.4	35	9.8	1	0.3	1	0.3
5	Training	35	9.8	34	9.5	-	-	1	0.3
6	Planning, Research & Statistics	30	8.4	30	8.4	-	-	-	-
	<b>Total</b>	<b>359</b>	<b>100</b>	<b>350</b>	<b>97.6</b>	<b>5</b>	<b>1.5</b>	<b>4</b>	<b>1.2</b>

Source: Field survey, 2019.

Table 4.1 above shows that out of the 359 copies of questionnaire administered on the target respondents, 350 (97.6%) were returned well completed and, therefore, accepted, while 5 (1.5%) were not returned at all owing to one reason or the other and 4(1.2%) were returned badly completed and therefore rejected. It is, therefore based on this 350 copies of questionnaire that the analysis that follow below were made.

## II. ANALYSIS OF THE DEMOGRAPHY OF RESPONDENTS

Table 6. Demography of Respondents

S/NO	VARIABLE	CATEGORY	NO	%
1	Gender	Males	252	72.0
2	Age	Female	98	28.0
		20-25 years	98	28.0
		20-35 years	7	2.0
		36-45 years	132	37.7
		46-55 years	88	25.1
		56-65 years	18	5.1
3	Marital Status	Single	70	20.0
		Married	189	54.0

		Widowed/widowed	35	10.0
		Divorced	28	8.0
		Separated	28	8.0
4	Educational Qualification	First sch. Leaving Certificate	11	3.1
		WASC/SSSC/GCE	178	50.9
		OND/NCE	70	20.0
		HND/Bachelor's Degree	70	20.0
		Masters degree and above	21	6.0
5		Working Experience/ years of service	1-5 year	8
	6-10 years		70	20.0
	11-15 years		158	45.1
	16-25 years		106	30.3
	26-35 years		8	2.3
6	Department	Operations,	141	40.3
		General Investigations & Intelligence	59	16.9
		Work & Logistics/ Supplies	51	14.6
		Admin & Finance	35	10.0
		Training	34	9.7
		Planning, Research & Statistics	30	8.6

*Source:* Field Survey, 2019.

The table above shows the distribution of the demographical variables/attributes of the 350 respondents with regard to gender, age, marital status, educational qualification, working experience, and departments.

#### A. Responses to the Questionnaire Items on the three Research Constructs of the Study

**Research Question No. 1:** What is the effect of the capacity level of the Nigeria Police to collect and preserve DNA evidence and use same for

courtroom prosecution on the efforts by the agency at fighting crime in the country by using DNA profiling?

Table 7 Responses to The Questionnaire Items Pertaining to Research Question No. 1

S/NO	ITEM	SA	A	UD	SD	D
1	Officers and men of the Nigeria Police have the requisite knowledge and technical skills in forensic science needed for collection of forensic DNA evidence in the course of criminal investigation	135	158	15	18	24
2	Officers and men of the Nigerian Police have the requisite knowledge and technical skills in forensic science needed for preserving the DNA evidence that they may collect in the course of criminal investigation.	114	141	30	25	40
3	Officers and men of the Nigeria Police have the intellectual and technical capabilities needed for effective use of the forensic DNA evidence collected during criminal investigation for courtroom prosecution of suspects.	125	148	19	26	32
	<b>Total</b>	<b>374</b>	<b>447</b>	<b>64</b>	<b>69</b>	<b>94</b>

Source: FieldSurvey, 2019.

Table 7 above shows the distribution of responses to the three items that pertain to the Research Question No. 1 of the study.

**Research Questions No. 2:** What is the effect of availability or non-availability of forensic DNA technology in Nigeria on the efforts by the Nigerian Police at fighting crime in the country by using DNA profiling?

### B. Responses to The Questionnaire Items Pertaining to Research Question No. 2

S/NO	ITEM	SA	A	UD	SD	D
1	The Nigeria Police a have no access to quality or sophisticated forensic DNA technology badly needed for forensic investigation owing to the fact that such technology is not available in Nigeria.	122	159	30	21	18
2	The Nigeria Police lack access to quality or sophisticated forensic DNA technology needed for forensic criminal investigation due to lack of funds.	117	146	24	30	33
3	The Nigeria Police lack access to the quality or sophisticated forensic DNA technology needed for forensic criminal investigation due to the lack of political will on the part of successive governments to the rising wave of crime in the country a very serious	99	161	30	26	34

	fight.					
	Total	338	466	84	77	85

Source: FieldSurvey, 2019.

Table 8 above shows the distribution to the three questionnaire items that pertain to the Research Question No. 3.

**Research Question No. 3:** What is the effect of availability or non-availability of a central DNA database in Nigeria on the efforts by the Nigeria Police at fighting crime in Nigeria by using DNA profiling?

Table 8 Responses to the Questionnaire Items on Research Question No. 3

S/No	QUESTIONNAIRE ITEM	SA	A	UD	D	SD
1	Lack of adequate number of forensic science laboratories in Nigeria for faster processing of DNA samples from both crime scenes and suspects militates against the efforts to establish a robust central DNA database for criminal investigation in Nigeria.	121	17	25	10	16
2	Lack of sophisticated DNA equipment in Nigeria significantly hampers the efforts to establish a robust central DNA database for forensic criminal investigation in the country.	106	149	27	29	39
3	Lack of adequate professional personnel needed for manning a central DNA database is a major factor that militates against establishment of a robust central DNA database in Nigeria.	129	138	26	23	34
	<b>TOTAL</b>	356	345	78	62	89

Source: Field Survey, 2019.

Table 8 shows the distribution of responses to the questionnaire items on the Research Question No. 3 of the study

### C. Test of Hypotheses

**Hypotheses No. 1:** The capacity level of the Nigeria Police to collect and preserve forensic-DNA evidence as an investigative tool and use same for courtroom prosecution of criminal suspects has no significant effect on the agency's efforts at fighting crime in the country by using DNA profiling.

Table 9 Chi-Square Computer from Frequency Cross Tabulation

	F-VALUE	Df	Asymp. Sig. (2-sided)
Pearson Chi-square	33.34	8	.000
Likelihood Ratio	168.203	8	.000
Linear-by-Linear Association	52.110	1	.000
N of valid cases	350		

Sources: Field Survey, 2019; SPSS output

Table 9 above shows the output of the computed Chi-Square values from the Cross Tabulation Statistics of observed and expected frequencies based on the response options provided from the responses of the target respondents. The Pearson Chi-Square computed value is  $X_c^2 = 33.34$ , while Chi-Square tabulated (critical) value is  $X_t^2 = 15.507$ , all at 8 degree of freedom (df) and 0.05 significance level: This means that the calculated value is greater than the table (critical) value (i.e  $X_c^2 > X_t^2$ ;  $p = 0.05$ ).

**Decision:**

Since the Pearson Chi-Square computer is  $X_c^2 = 33.34$  which is greater than Chi-Square table value of  $X_t^2 = 15.507$ , the alternate hypothesis is accepted, thus rejecting the null hypothesis. Thus, we concluded that the capacity level of the Nigeria Police to collect and preserve forensic-DNA evidence as an investigative tool and use same for courtroom prosecution of criminal

suspects has significant effect on the agency’s efforts at fighting crime in the country by using DNA profiling.

**Hypothesis No. 2:** Availability or non-availability of adequate DNA technology and infrastructure in Nigeria has no significant effect on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.

Table 10 Pearson Chi-Square Test as Computed from the Frequency Cross Tabulation Statistics

	F-Value	Df	Asymp. Sig (2-sided )
Pearson Chi-Square	54.47	8	.000
Likelihood Ratio	158.203	8	.000
Linear-by-Linear Association	51.110		
N of Valid Cases		1	.000

Source: Field Survey, 2019; SPSS output

Table 10 shows the output of the computed Chi-square values from the Cross Tabulation Statistics of observed and expected frequencies based on the response options based on Likert-type scale. From the responses of the target respondents. Pearson Chi-Square computed value is  $X_c^2 = 54.47$ , which is greater than the Chi-Square tabulated value of  $X_t^2 = 15.507$  at 8 degree of freedom (df) and 0.05 alpha level: ( $X_c^2 = 54.47 > X_t^2 15.51$ ;  $p = 05$ ).

**Decision:**

Since the Pearson Chi-Square computed is  $X_c^2 54.47$  which is greater than chi-square table value of  $X_t^2 = 15.507$  the alternate hypothesis is accepted, thus rejecting the null hypothesis. Thus we conclude that availability or non-availability of adequate DNA technology and infrastructure in Nigeria has significant effect on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.

**Hypothesis No. 3:** Availability or non-availability of a central DNA database in Nigeria has no significant effect on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.

Table 11 Chi-Square Test Computed from Frequency Cross Tabulation

	F-Value	Df	Asymp. Sig (2.sided)
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Pearson Chi-square	38.79	8	.000
Likelihood Ratio	168.203	8	.000
Linear-by-linear Association	52.110	1	.000
N of valid cases	350		

Source: SPSS Output; Field Survey, 2019.

**Research Questions No. 3:** What is the effect of the availability or non-availability of a central DNA database in Nigeria on the efforts by the Nigeria Police at fighting crime in the country by using DNA profiling?

Table II shows the output of the computed Chi-square values from the Pearson's Cross Tabulation statistics of observed and expected frequencies based on the response options set on likert-type scale from the responses of the target respondents. Pearson Chi-square computed value is  $X_c^2$  38.79, which is greater than the Chi-Square tabulated value of  $X_t^2$  15.507 at 8 degree of freedom (df) and 0.05 alpha level: ( $X_c^2$  38.79 >  $X_t^2$  15.51;  $P < 0.05$ ).

**Decision:**

Since the Pearson Chi-square computed is  $X_c^2 = 38.79$  which is greater than Chi Square table value of  $X_t^2 = 15.507$ , the alternate hypothesis should be accepted, thus rejecting the null hypothesis. Thus, we conclude that availability or non-availability of a central DNA database in Nigeria has significant effect on the efforts by the Nigeria Police at fighting crime in the country using DNA profiling.

## SUMMARY OF MAJOR FINDINGS

In the course of this study, a number of findings have been made. Prominent among these findings are summarized as follows:

1. The capacity level of the Nigeria Police to collect and preserve forensic DNA evidence in the process of their criminal investigation and use same for courtroom prosecution has significant effect on the efforts by the agency to fight crime in the country through DNA profiling ( $X_c^2$  33.34 >  $X_t^2$  15.51;  $p = 0.05$ ).
2. Availability or non-availability of sophisticated DNA technology in Nigeria has significant effect on the efforts being made by the Nigeria Police to fight crime in the country through DNA profiling ( $X_c^2$  54.47 >  $X_t^2$  15.51;  $p = 0.05$ ).

3. Availability or non-availability of a central DNA database in Nigeria has significant effect on the efforts being made by the Nigeria Police to fight crime through DNA profiling ( $X^2_c 38.79 > X^2_t 15.51$ ;  $p= 0.05$ ).

## CONCLUSION

The past decade has seen great advances in a powerful criminal justice tool, particularly deoxyribonucleic acid, or DNA. DNA can be used to identify criminals with incredible accuracy, when biological evidence exists. By the same token, DNA can be used to clear suspects and exonerate persons mistakenly accused or convicted of crimes. In all, DNA technology is becoming increasingly vital to ensuring accuracy and fairness in the criminal justice system.

DNA is generally used to solve crime in one of two ways. In cases where a suspect is identified, a sample of that persons DNA can be compared to evidence from the crime scene. The result of this comparison may help establish whether the suspect committed the crime. In cases where a suspect has not yet been identified, biological evidence from the crime scene can be analyzed and compared to *offender profiles in DNA databases* to help identify the perpetrator. This process is known as DNA profiling. Crime scene can also be linked to other crime scene through the use of DNA database.

In Nigeria, the Nigeria police is one of the leading agencies statutorily charged with the responsibility of providing internal security through fighting of crime. The agency does this job by first undertaking criminal investigation with a view to collecting evidence to be used for courtroom prosecution of criminal suspects. Since 1930 the agency was established, it has relied mainly on the traditional (“old school”) method of criminal investigations based on eye witness testimonies and statements, the investigators sense of judgment, and experience. Overwhelming evidence point to the fact that the said method has proved ineffective, as many unsolved crimes, wrongful prosecution or conviction of innocent criminal suspects, and failed courtroom prosecution litter the performance profiles of the Nigeria police.

In response, the Nigeria police recently commenced the use of forensic DNA profiling as a tool for criminal investigation and courtroom prosecution of criminal suspects as part of its efforts to manage crime in the country. Based on the finding of this study, as highlighted earlier in this chapter, it is the conclusion of the study that the capacity level of the Nigeria Police to collect and preserve the DNA evidence as part of the agency’s criminal investigation process and use same for courtroom

prosecution has significant effect on the effort it makes to fight crime through DNA profiling, and that the availability or non-availability of sophisticated DNA technology in Nigeria has significant effect on the effort, the Nigeria police makes to fight crime through DNA profiling. It is also the conclusion of the study that availability or non-availability of a central DNA database in Nigeria has significant effect on the efforts the Nigeria police makes to fight crime through DNA profiling.

## RECOMMENDATIONS

Based on findings made in the course of this study and the conclusion reached on those findings, the following recommendations have been made:

1. Governments in general, the various law enforcement agencies in the country and the Nigeria Police should muster the badly needed political will with regard to the issue of DNA profiling as part of the process of criminal investigation across the country. This could be done by way of ensuring that adequate funds are provided for issues associated with DNA profiling.
2. Efforts should also be made to continually improve both the intellectual and technical capabilities of the rank and file of the Nigeria Police on forensic investigation and prosecution through constant training and development.
3. Efforts should also be made by the Nigeria authorities, particularly the Nigeria Police to establish central DNA database in the country as is done by most developed countries across the world. This database if established and well managed has the potential to link all crime scenes across the country.
4. Efforts should also be made by various Governments in Nigeria to establish as many forensic science laboratories as possible toward faster processing of DNA samples from both crime scenes and criminal suspects across the country.
5. Authorities in Nigeria should also ensure that state-of-the-art DNA technology and equipment are always made available in Nigeria for purpose of establishing and running of both forensic science laboratories and a central DNA database in the country.
6. Authorities in Nigeria should also ensure that adequate number of the various professional personnel needed for DNA profiling, DNA database management, and forensic science laboratory including geneticists, DNA toxicologists, molecular biologists, laboratory technologists etc are produced by the higher education systems and training centres both locally and abroad.

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