



EXPERIENCES ON THE IMPLEMENTATION OF CODIS IN BOTSWANA



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INTRODUCTION

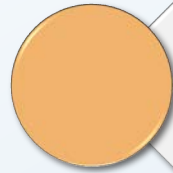


BOTSWANA

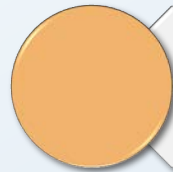
- **AREA(SIZE) : 580.730 sq km**
- **POULATION : App. 2.5m people**
- **Forensic Science Services is established within the Botswana Police Service**



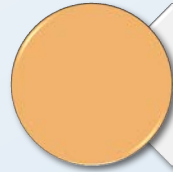
INTRODUCTION



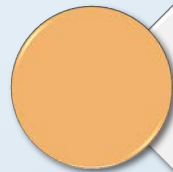
The collection, use and storage of DNA for forensic purposes has increased rapidly since 1995 when the World's first DNA database was set up.



Countries across the world are now establishing and expanding human DNA databases for use in civil and criminal matters.



Such DNA databases range in sizes from a few hundreds DNA profiles to millions of profiles.

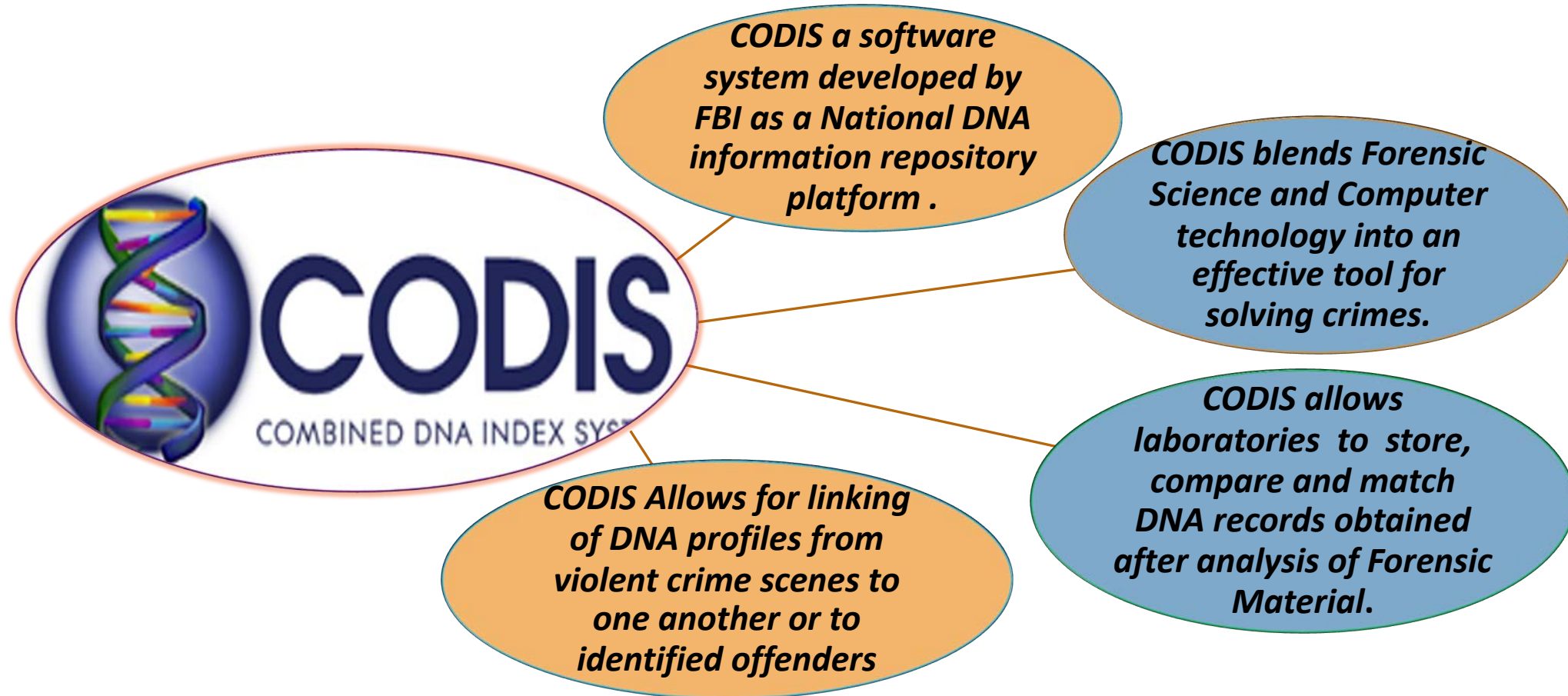


DNA databases exist to assist law enforcement agencies to identify DNA profiles of criminals involved in cases such as those of rape, homicides and property crime.



CODIS

COMBINED DNA INDEX SYSTEM





CODIS was officially activated as a database platform in the United States in **1998**



As at 2021 CODIS was Installed in **58** countries across the World.



Botswana is one of the few countries using CODIS as a National DNA Database in Africa.



The system was installed in Botswana in **2005**.



BOTSWANA NATIONAL DNA DATABASE



- The database system runs on a Local Area Network (LAN) and it is therefore not linked to any other system**
- Access to the system is controlled by use of password for authorized users**
- The current server platform has a 2 terabytes capacity and uses Microsoft Windows Server Standard Edition and SQL Server**
- The system operates on the latest version of CODIS Software; Version 9**
- The system currently holds a total of 24 500 DNA profiles from different categories forensic material.**



BOTSWANA NATIONAL DNA DATABASE



THE CODIS SYSTEM USES SEVERAL FUNCTIONAL MODULES:

DATA ENTRY MODULE

SPECIMEN MANAGER

SEARCHER MODULE

AUTO-SEARCHER MODULE

MATCH MANAGER MODULE

POPSTATS MODULE



DATA-ENTRY WINDOW

Analyst Workbench - SDIS:BWFLS2869 - SM:Default: Specimen Details (5)

File Go View Specimen Details Tools Window Help

Workbench Explorer

- Specimen Manager
 - All Accepted Profiles
 - All Specimens by Index and Lab
 - All Specimens by Lab and Index
 - Complete Specimens by Index and Lab
 - Complete Specimens by Lab and Index
 - Complete STR Specimens by Index and Lab
 - Complete STR Specimens by Lab and Index
 - EUSR-Inserted Specimens
 - Expired Rapid Enabled Specimens
 - Incomplete Profiles by Index and Lab
 - Incomplete Profiles by Lab and Index
 - Incomplete STR Profiles by Index and Lab
 - Incomplete STR Profiles by Lab and Index
 - Inconsistent Source ID Based on Display
 - Inconsistent Source ID Based on Display
 - Marked Profiles
 - Marked Specimens with Unmarked Up
 - Never Searched by Index and Lab
 - Never Searched by Lab and Index
 - New
 - Pending Profiles 1
 - Pending Profiles 2
 - Prüm Specimens without a Prüm Match
 - Received Last Month
- Message Center
- Specimen Manager
- Match Manager
- Pedigree Manager
- Rank Manager
- Searcher
- AutoSearcher
- STR Data Entry
- mtDNA Data Entry
- Popstats

1:Default View IS:Default Identity AS: Default Identity SM:Default MM:Default Forensic Single Sample SM:Default: Specimen Details (4) SM:Default: Specimen Details (5)

Specimen ID: .SUS000 1HI04312021
Agency ID: BWFLS2869
Category: Suspect, Known
Indexes: Suspect
Source ID: Yes
Partial Profile: No
Case ID: HI431/21
Source Agency:
Rapid Enabled: N/A
MME:
MRE:
Modified Date: 2023-06-01 09:03:04

Upload
Upload Number: 0
(N) Reconciliation Code:
External Agency
NCIC Number:
VICAP Number:

Audit Trail
(N) Processed | (S) Submitted | (S) Processed | (L) Submitted | Marked |
By:
Date:

STR | mtDNA | Y-STR | Audit Trail Details |

Assigned To: bnalesha STR Alt. Agency ID:
Assigned Date: 06-01-2023 STR Alt. Spec ID:

Comments:

Drag a column header here to group by that column

Locus	Kit	Allele1	Allele2	Batch ID	Import File	(N) Processed Date	(N) Processed By	Upload #
Amelogenin	Identifiler Plus	X	Y					0
D8S1179	Identifiler Plus	12	13					0
D21S11	Identifiler Plus	31.2						0
D7S820	Identifiler Plus	8	11					0
CSF1PO	Identifiler Plus	11						0
D3S1358	Identifiler Plus	14	16					0
TH01	Identifiler Plus	8						0
D13S317	Identifiler Plus	8	12					0
D16S539	Identifiler Plus	10	11					0
D2S1338	Identifiler Plus	19	21					0
D19S433	Identifiler Plus	13	14.2					0
vWA	Identifiler Plus	16						0
TPOX	Identifiler Plus	8	9					0
D18S51	Identifiler Plus	16	18					0
D5S818	Identifiler Plus	11	12					0
FGA	Identifiler Plus	20	23					0

Activate Windows
Go to Settings to activate Windows.

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SPECIMEN MANAGER WINDOW

Analyst Workbench - SDIS:BWFL2869 - SM:Default

File Go Specimen Manager Tools Window Help

Workbench Explorer
Specimen Manager
Default
All Accepted Profiles
All Specimens by Index and Lab
All Specimens by Lab and Index
Complete Specimens by Index and Lab
Complete Specimens by Lab and Index
Complete STR Specimens by Index and Lab
Complete STR Specimens by Lab and Index
EUSR-Inserted Specimens
Expired Rapid Enabled Specimens
Incomplete Profiles by Index and Lab
Incomplete Profiles by Lab and Index
Incomplete STR Profiles by Index and Lab
Incomplete STR Profiles by Lab and Index
Inconsistent Source ID Based on Discrepancies
Inconsistent Source ID Based on Discrepancies
Marked Profiles
Marked Specimens with Unmarked Lab
Never Searched by Index and Lab
Never Searched by Lab and Index
New
Pending Profiles 1
Pending Profiles 2

Delete Reports AutoSearcher Reports PT:Default RM:Default View IS:Default Identity AS: Default Identity SM:Default

Drag a column header here to group by that column

Agency	Spec ID	Indexes	MME	MRE	# STR Loci	# Fragments	(N) Processed Date	(N) Processed By
BWFL2869	.SUS0001H104312021	Suspect			16	0		
BWFL2869	.SUS0001M01562021	Suspect			16	0		
BWFL2869	.SUS0001R00352019	Suspect			16	0		
BWFL2869	.SUS0001R09272021	Suspect			16	0		
BWFL2869	.SUS0001R09282021	Suspect			16	0		
BWFL2869	.SUS0001R09292021	Suspect			16	0		
BWFL2869	.SUS0001R09402022	Suspect			16	0		
BWFL2869	.SUS0001R09562022	Suspect			16	0		
BWFL2869	.SUS0001R1132022	Suspect			16	0		
BWFL2869	.SUS0001R13812022	Suspect			16	0		
BWFL2869	.SUS0001R14022021	Suspect			16	0		
BWFL2869	.SUS0001R14152022	Suspect			16	0		
BWFL2869	.SUS0001R14162022	Suspect			16	0		
BWFL2869	.SUS0002R09272021	Suspect			16	0		
BWFL2869	.SUS0002R09562022	Suspect			16	0		
BWFL2869	.SUS0003R09562022	Suspect			16	0		
BWFL2869	.SUS0004R09282021	Suspect			16	0		
BWFL2869	.SUS0004R09562022	Suspect			16	0		
BWFL2869	CSC0001E01092018	Crime Scene Sample			16	0		
BWFL2869	CSS00001E02032017	Crime Scene Sample			16	0		
BWFL2869	CSS00001E02092017	Crime Scene Sample			12	0		
BWFL2869	CSS0001E00012017	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00022020	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00022022	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00032017	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00032018	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00042018	Crime Scene Sample			15	0		
BWFL2869	CSS0001E00042022	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00052018	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00062011	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00062015	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00062018	Crime Scene Sample			15	0		
BWFL2869	CSS0001E00062020	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00072011	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00072014	Crime Scene Sample			15	0		
BWFL2869	CSS0001E00072020	Crime Scene Sample			15	0		
BWFL2869	CSS0001E00082011	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00082014	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00082015	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00082016	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00092014	Crime Scene Sample			16	0		
BWFL2869	CSS0001E00092020	Crime Scene Sample			16	0		

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NGISS Status: Running

Activate Windows
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MATCH MANAGER WINDOW

Analyst Workbench - SDIS:BWFL2869 - MM:Default

File Go Match Manager Tools Window Help

Workbench Explorer

Match Manager

Saved Views

- Default
- All Duplicate Matches from OTS and A
- All Matches by Disposition, Target Lab
- All Matches by Loci, Stringency
- All Matches by Target Lab, Disposition
- All Matches from AutoSearcher-Convic
- All Matches from OTS-Unreviewed Off
- All Matches with given Disposition Date
- AutoSearcher 1 of 2016
- Batch Searcher Matches
- EUSR Matches
- Forensic to Forensic Matches
- Forensic to Offender Matches
- Match Summary, by Disposition, Month
- Match Summary, by Month, Disposition
- Matches by Note Example
- Matches by Search Level
- Matches Not Mailed
- Matches Not viewed...07.04.17
- Matches that should be re-evaluated
- Matches with Disposition Discrepance
- Matches with Updated Profiles
- NDIS Matches (AutoSearcher)

Message Center

Specimen Manager

Match Manager

Pedigree Manager

Rank Manager

Searcher

AutoSearcher

STR Data Entry

mtDNA Data Entry

Popstats

Delete Reports AutoSearcher Reports PT:Default RM:Default View IS:Default Identity AS: Default Identity SM:Default **MM:Default**

Drag a column header here to group by that column

Target Index	Target Source ID	Candidate Agency ID	Candidate Specimen ID	Candidate Index	Candidate Source ID	Target Disposition
Suspect	Yes	BWFL2869	SUS000 1R01322009	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01332009	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01342009	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01392004	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01632005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01662008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01812009	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R01992008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02002009	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02342007	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02512004	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02662007	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02732005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02732005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02732007	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02812006	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02832006	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02852007	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3R02872005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02862005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3R02872005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R02922008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R03002009	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R03152005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R03152005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R03152005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R03932005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R03952005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R04352006	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R04882007	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R05432006	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 1R05812006	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 2R00762004	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 2R02862005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 2R02862005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 2R02882005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 2R02882005	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3R04022008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3HI00062008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3HI00602008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3HI00602008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3HI00612008	Suspect	Yes	Forensic Hit
Suspect	Yes	BWFL2869	SUS000 3R02772008	Suspect	Yes	Forensic Hit

Record 1 of 2980

Ready.

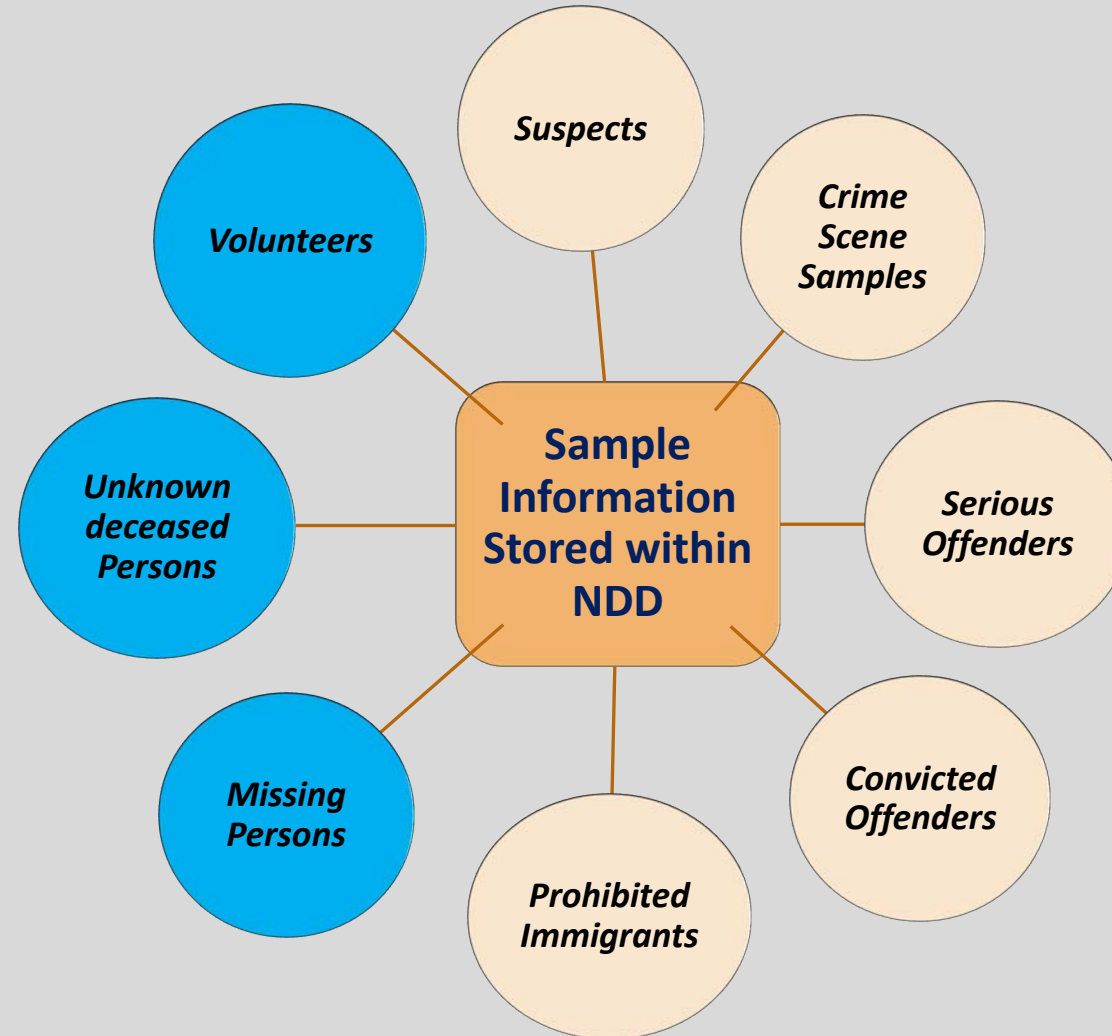
Activate Windows
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CATEGORIES OF INDICES WITHIN THE NDD





IMPLEMENTATION OF CODIS IN BOTSWANA



2004

- Training of BPS officers by FBI on CODIS System

2005

- Acquisition of server platform and computer stations by BPS
- Installation of CODIS **Version 5.7.4**
- Signing of Memorandum of Agreement between FBI and BPS
- Building up of the DNA databank [Uploading of DNA profiles]

2011

- Full scale operation of the NDD in criminal investigations as an intelligence tool
- Identifications of offenders made through CODIS for the first time
- 11 hits on cold cases made from the database

2014

- Enactment of the Forensic Procedures Act, 2014
- Establishment of the DNA Database as a legal tool for investigation



IMPLEMENTATION OF CODIS IN BOTSWANA



2015

- Acquisition of new server platform and computer stations
- Upgrading of CODIS system to CODIS **Version 7.0** by FBI
- Training of BPS officers on the use of CODIS system by FBI

2019

- Alignment of the Database to the requirements of the Act
- Appointment of members of the NDD Advisory Board
- Development of Guidelines on the use of the NDD
- Implementation of FPA
- Upgrading of CODIS to CODIS **Version 8.0**

2022

- Upgrading of CODIS to **Version 9.0** (current Version)



USE OF NDD IN THE FIGHT AGAINST GENDER BASED VIOLENCE CASES

- The NDD has offered great assistance in the investigations of GBV cases through generation of identifications (Hits).
- The Crime Scene Index of the NDD mostly comprises of samples from victims of sexual offenses (>95%) in which assailants were unknown.
- So far a total of 358 offenders have been identified through the database and were linked to cold cases.
- 14 % of the identified suspects were involved in more than one cold case (repeat offenders), most notable being one suspect who was identified in 16 cold cases .



NUMBER OF OFFENDERS IDENTIFIED EACH YEAR THROUGH THE DNA DATABASE

YEAR	TOTAL NUMBER OF OFFENDERS IDENTIFIED IN COLD CASES (HITS)
2011	11
2012	10
2013	6
2014	16
2015	<i>Nil (system upgrading)</i>
2016	2
2017	40
2018	82
2019	49
2020	70
2021	57
2022	<i>Nil (System upgrading and server breakdown)</i>
2023 (to date)	15
<u>TOTAL No. Of IDENTIFIED OFFENDERS</u>	<u>358</u>



CODIS BREAKTHROUGH CASE [A CASE OF A SERIAL OFFENDER]

A series of rape incidents occurred in **2017** and **2018** where several women were attacked and raped by an unknown assailant around Gaborone area.

The victims were attacked at night in their homes when they were asleep.

The unknown assailant covered his face with a balaclava mask during the attacks and could not be recognised by any of the victims

In cases that were reported samples were collected from victims and submitted to the laboratory for analysis and searching from the DNA database.

The **16** cases generated a hit against a single suspect whose DNA was already in the database and the suspect was identified. He currently holds the highest number of “Hits” from our database so far.



CODIS BREAKTHROUGH CASE [A CASE OF A SERIAL OFFENDER]

1 offender

**Identified in 16
cold cases of rape**

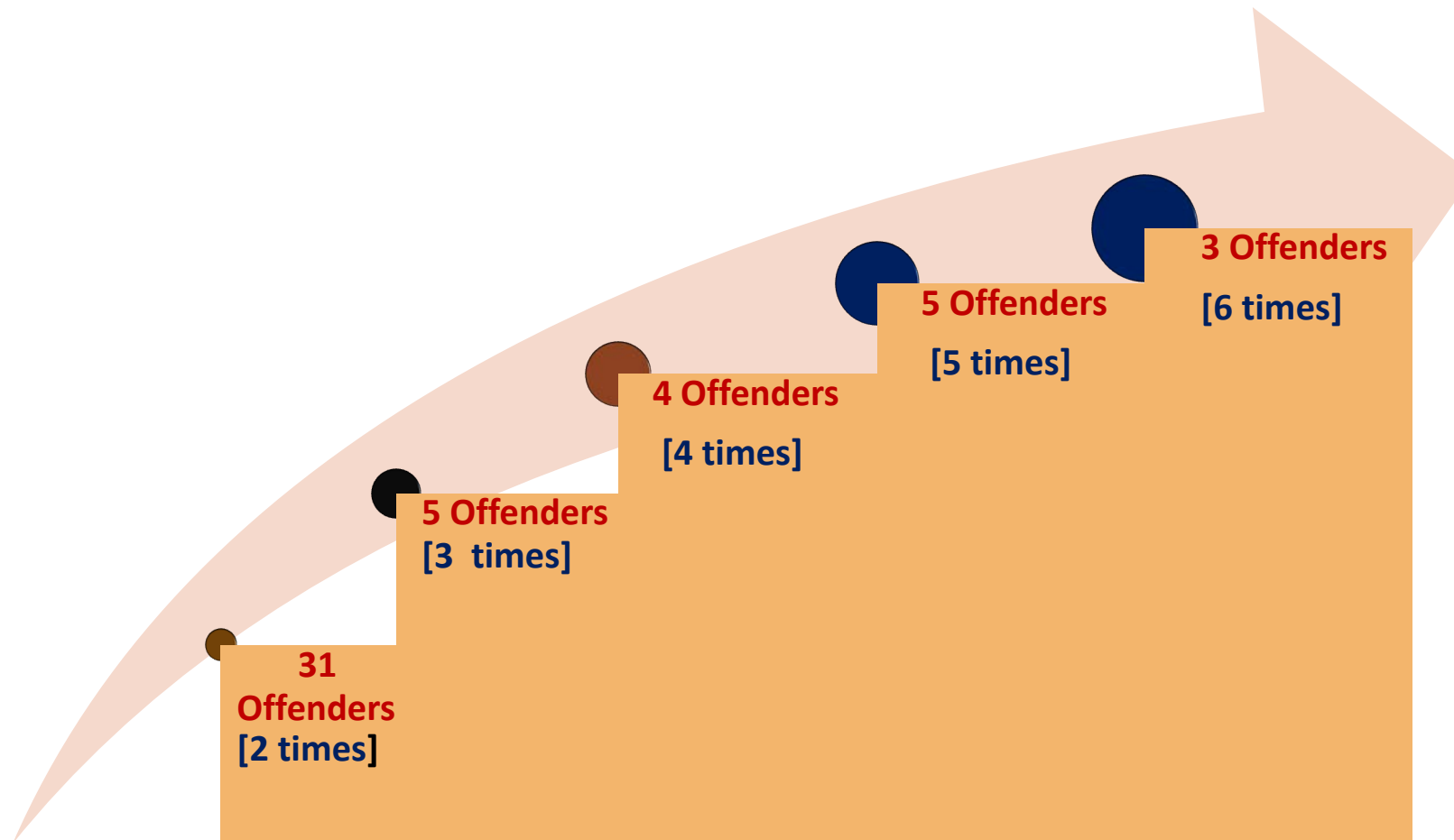


CASES PER POLICE STATION [A CASE OF A SERIAL OFFENDER]





SERIAL OFFENDERS IDENTIFIED IN MULTIPLE OFFENSES THROUGH CODIS





NDD MANAGEMENT

The NDD is managed through an Act of Parliament [Forensic Procedures Act,2014].

Also established under the Act is the National DNA Database Advisory Board which provides an oversight responsibility on the use of the NDD.

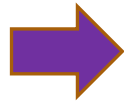
The Act places limitations on the data allowed into the NDD and the use of that data.

The Botswana Police Service is the custodian of the NDD.



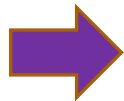
CHALLENGES IN OPERATION OF THE NDD

Under utilization of Information generated from DNA database



- ❖ Low action by investigators on investigative leads provided through the database.
- ❖ This results in ineffective investigations by law enforcement on cold cases allowing repeat offenders to evade justice.

Low use of Database in volume crimes

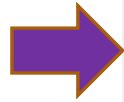


- ❖ The FSS records comparatively low numbers of evidence/exhibits relating to volume crimes (e.g. burglary).
- ❖ Most samples are from high level crime such as rape and homicides.
- ❖ There is a possibility of non-detection of offenders in those cases if such evidence is disregarded.
- ❖ The result is a loss of opportunity to utilize databases for possible perpetrator identification.



BENEFITS OF IMPLEMENTING NDD

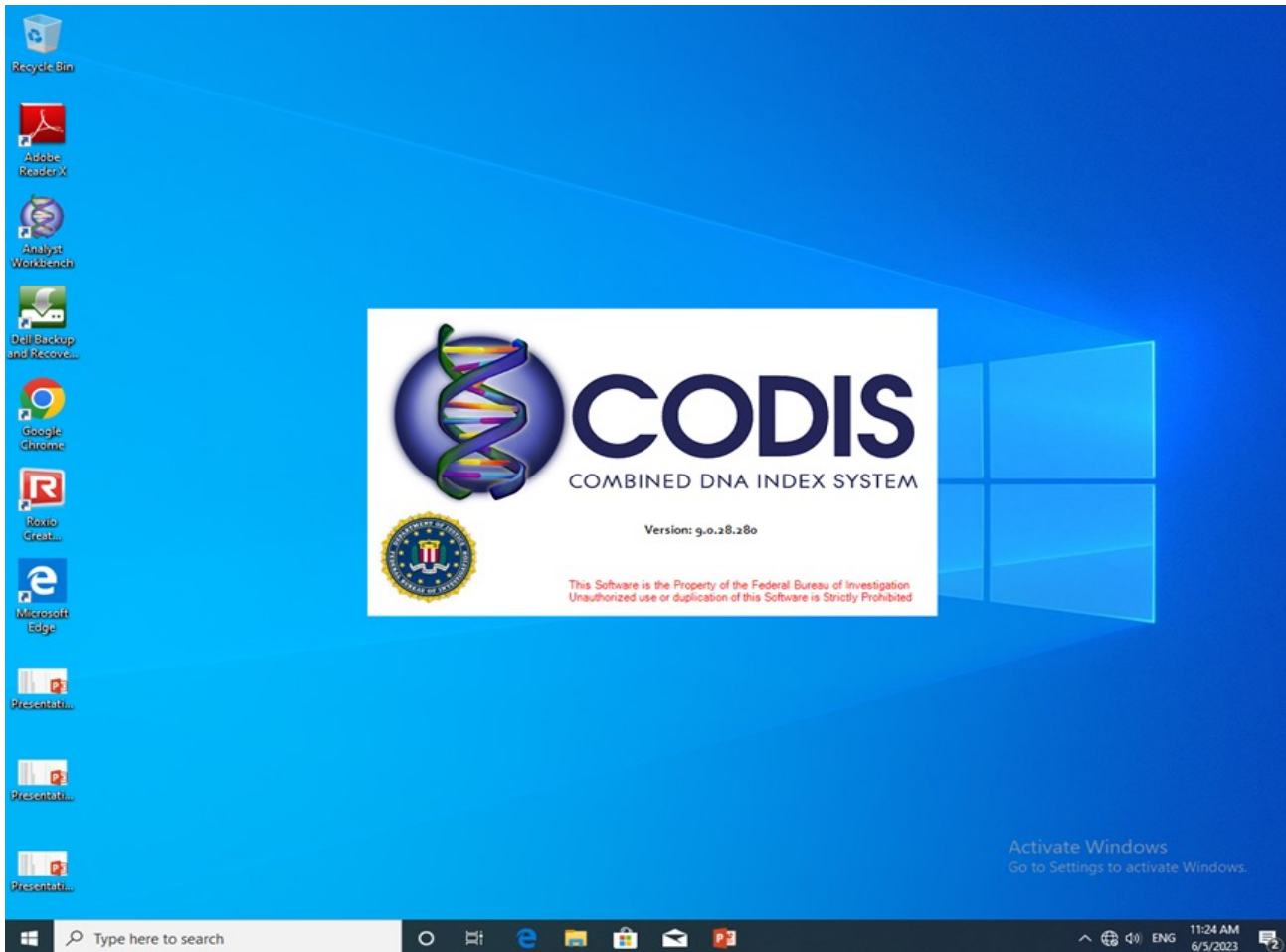
The benefits that accrue from implementing the DNA Database include:



- ❖ Increased resolution of unsolved crimes.
- ❖ Allows investigators to channel resources directly into the provided leads for crime and removes potential suspects from investigation.
- ❖ Increased detection of suspects reduces recidivism (repeat offending).
- ❖ Increase in the effective and timely identification of disaster victims and missing persons.
- ❖ Database can also assist in identifying suspects who commit cross-border crime (through Interpol DNA Gateway).



DNA DATABASES : THE ANSWER



**SOLVES
CRIME**

**PREVENTS
CRIME**

**EXONORATES
THE
INNOCENT**

**SAVES
MONEY**

