Republic of Botswana

MINISTRY OF HEALTH & WELLNESS

2021 BOTSWANA HIV CASE SURVEILLANCE IMPLEMENTATION GUIDE

SEPTEMBER 1, 2021

FOREWORD

Finalizing the Botswana HIV Case-Based Surveillance Implementation Guidelines 2021 is a collaborative effort of the Botswana HIV CBS technical working group (TWG). The Surveillance Unit of the Ministry of Health and wellness (MOHW) has led this effort and has steered the formation and efforts of the Botswana HIV case based surveillance (CBS) TWG culminating in the finalization of these guidelines.

The HIV CBS TWG comprises individuals from the various departments and programs of the Ministry of Health and Wellness. It also comprises our collaborators, including individuals and experts from research and development partners and civil society organizations.

These guidelines will play a pivotal role in successfully implementing HIV CBS in Botswana and will be an important tool for health care workers in the facilities.

Many thanks,

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Health Services Monitoring & Evaluation, Quality Assurance (HSMEQA)

ACRONYMS

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
ARV	Antiretroviral
ART	Antiretroviral therapy
BAIS	Botswana AIDS Impact Survey
BBS	Bio Behavioral Surveillance
CBS	Case Based Surveillance
CD4	Cluster of Differentiation 4
CDC	U.S. Centers for Disease Control and Prevention
CRF	Case Report Form
DHIS	District Health Information Software
DHMT	District Health Management Team
DIT	Department of Information Technology
DNA	Deoxyribonucleic Acid
DOB	Date of Birth
DQI	Data Quality Improvement
DSO	Data Support Officer
EMR	Electronic Medical Record
FSW	Female Sex Worker
GDN	Government Data Network
GOB	Government of Botswana
HCA	Health Care Auxiliary
HI	Health Informatics
HIV	Human Immunodeficiency Virus
HIVDR	HIV Drug Resistance
HSMEQA	Health Services Monitoring & Evaluation, Quality Assurance
HTS	HIV Testing Services
ICD	International Classification of Disease
ID	Identification
IDCC	Infectious Disease Control Center
IDSR	Integrated Disease Surveillance and Response
IPMS	Integrated Patient Management System
IRB	Institution Review Board
IT	Information Technology
KP	Key Populations
LFT	Liver Function Tests
LTFU	Loss to Follow Up
M&E	Monitoring and Evaluation
MOHW	Ministry of Health and Wellness
MSM	Men who have Sex with Men

NCD	Non-Communicable Disease
NDW	National Data Warehouse
NHL	National Health Laboratory
NGO	Nongovernmental organization
NSF	National Strategic Framework
PCR	Polymerase chain reaction
PEPFAR	United States Presidents Emergency Plan for AIDS Relief
PII	Personal Identifiable Information
PIMS	Patient Information Management System
PLHIV	People Living With HIV
PMTCT	Prevention of Mother to Child Transmission
RITA	Recent Infection Testing Algorithm
SO	Surveillance Officer
SOP	Standard Operating Procedure
STI	Sexually Transmitted Infection
TA	Technical Assistance
TB	Tuberculosis
TG	Transgender
TOT	Trainer of Trainers
TPT	Tuberculosis Presumptive Treatment
TWG	Technical Working Group
UNAIDS	Joint United Nations Program on HIV/AIDS
USAID	U.S. Agency for International Development
VL	Viral Load
WHO	World Health Organization

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BACKGROUND

1.1 **HIV Epidemiology in Botswana**

Botswana is a sparsely populated, landlocked country with a population of 2.3 million [1]. HIV prevalence among adults in Botswana was 19.9% in 2020, among the highest on the continent.[2] Incidence in Botswana steadily decreased from 10.4 per 1000 population in 2012 to 4.4 per 1000 population in 2020. Per the UNAIDS AIDS Info website (accessed July 13, 2021), an estimated 381,000 persons are living with HIV in Botswana, with 324,900 on ART. Botswana is close to achieving epidemic control, and recent UNAIDS estimates suggest that Botswana has achieved the 90-90-90 global HIV targets of 90% of people living with HIV (PLHIV) know their status, of which 90% are on HIV treatment of which 90% are virally suppressed and is working towards the 95-95-95 targets. Despite these achievements, PEPFAR data suggest deficits in 95-95-95 attainment remain in specific population groups, particularly among adolescent girls, young women, and adult men.

1.2 **MOHW Strategic Direction and Support for HIV CBS**

HIV/AIDS remains one of the major public health challenges in Sub-Saharan Africa—Botswana is no exception. Since 2002, MOHW has listed HIV a reportable disease in Botswana through the Integrated Disease Surveillance and Response (IDSR) strategy and the Public Health Act of 2013 (111(b)) [4]. Additionally, HIV case surveillance is one of the priorities in the Third Botswana National Strategic Framework for HIV & AIDS (2018-2023) [5].

1.3 **Overview of HIV Case-Based Surveillance**

The World Health Organization (WHO) recommends developing a comprehensive strategic HIV information system to provide high-quality, timely, and reliable geographically granular data by population characteristics and across the different levels of a health care system. Case-based surveillance (CBS) is such a system, and it is a key element of HIV Second Generation Surveillance, which is recommended by the UNAIDS and WHO [3].

HIV case-based surveillance is a method used to capture individual-patient level information that is routinely generated for PLHIV. HIV CBS, furthermore, is a powerful tool for public health programs because it provides information on individuals with HIV throughout the course of their disease and their engagement with HIV care and treatment services. These key events, referred to as sentinel events, are used to monitor the entire spectrum of disease for everyone from HIV diagnosis to death. This information is reported from the point of service delivery to a central database for epidemiological analysis. HIV case-based surveillance is a powerful tool for public health programs.

Because HIV CBS systematically collects individual-level information (single case information) from multiple sources, it provides information on the entire spectrum of the clinical cascade. This cascade covers initial HIV diagnosis to viral suppression for an individual, inclusive of timeliness of linkage to care, immunologic and/or viral suppression, treatment failure, treatment switch to second line regimen, and death. These data are aggregated to measure national progress towards the attainment of the 95-95-95 targets. HIV CBS is not only important in tracking the progress towards epidemic control, but it is crucial to tracking the epidemic beyond the achievement of the 95-95-95 targets; it helps inform important parameters such as retention in care, location of clusters of new transmission, and HIV-associated comorbidities such as non-communicable diseases (NCDs).

1. Purpose and Scope of HIV CBS Implementation Guide

The HIV CBS implementation guidelines document is important because it describes the following:

- Key personnel in HIV CBS
- Roles and responsibilities
- Daily CBS business procedures
- Monitoring and evaluation of the HIV surveillance system

This document is intended to be used as a reference guide for HIV CBS by all persons working on HIV CBS surveillance. These include:

- MOHW and implementing partner health facility staff
- MOHW and implementing partner district staff
- MOHW and implementing partner national office staff
- Other stakeholders involved in the HIV CBS as authorized by MOHW

1.1 **Implementing HIV CBS in Botswana**

Surveillance has evolved in Botswana from the use of surveys as cornerstone for surveillance to HIV CBS. Previous surveillance activities in Botswana included antenatal clinic (ANC) sentinel surveillance surveys for pregnant women, Botswana AIDS Impact Surveys (BAIS), for monitoring the epidemic in the general population, Botswana Bio-Behavioral Surveys (BBS) for high-risk populations such as Men who have sex with men (MSM), female sex workers (FSW), Transgender (TG), and HIV drug resistance (HIVDR) surveillance.

Implementing the HIV CBS will allow Botswana:

1. To establish a longitudinal database of HIV positive individuals, regardless of age, from the point of diagnosis throughout the course of the disease including care and treatment until death.
2. To continually and routinely analyze the surveillance data to:
    - Monitor and track the impact of HIV programs on reaching and sustaining HIV epidemic control (proportion of people living with HIV who know their HIV status; proportion of those who know their status and are on ART; and proportion of those on ART and are virally suppressed) and attaining the 95-95-95 targets.
    - Monitor the HIV epidemic by assessing and determining trends in HIV prevalence, HIV recent infection or incidence (if data are available), TB and HIV, and mortality, resistance, acquisition of TB etc.) by age, sex, and geographic distributions, and identify factors associated with the events

- Characterize HIV cases by demographics, geographic distributions, and any potential risk behaviors when available, and clinical characteristics at the time of diagnosis and sentinel events (i.e., ART initiation, viral load results, pregnancy/birth outcomes, drug resistance)

3. To use the case surveillance data to monitor and improve the quality and impact of the HIV prevention and treatment programs including retention in care

2. Coordination and Implementation Framework

2.1 **Coordination Mechanism**

Implementing HIV CBS requires coordination from the national level led by the MOHW and other implementing partners down to the facilities where the data collection occurs.

2.1.1. National Level Coordination

The Surveillance Officer (SO), under the Department of Health Services Monitoring & Evaluation, Quality Assurance (HSMEQA) within the MOHW, is the national coordinator for all HIV CBS activities. Implementing partners and other stakeholders who form the HIV CBS TWG under the direction of the SO will implement CBS activities as outlined in these guidelines.

2.1.2 District Level Coordination

The District Health Management Team (DHMT) Coordinator is responsible for all activities in the district and is the official coordinator for all HIV CBS related activities. The district trainer of trainers (TOTs) *[Appendix 1*], together with the DHMT, are responsible for ensuring that HIV CBS activities are implemented in the district as planned.

2.1.3 Facility Level Coordination

The facility officer in charge is responsible for coordinating HIV CBS-related activities at the facilities. This person works in close collaboration with the CBS TOT and the DHMT.

Table 1. Staff Roles and Responsibilities for HIV CBS

STAFF	ROLE	Output
Site-level Staff (Counselor, Nurse, Clinician, Data Entry Clerk, Data Support Officer)	1. Completion of paper-based Case Report Forms (CRF) for new diagnoses and follow up sentinel events. [*Appendix 3A and 3B*] for facilities without an electronic medical record (EMR). 2. Follow up of patients based on feedback from CBS Program Officers at national and district level 3. Correctly capture client CBS information in the EMR or any other EMR that is in use at the facility according to the EMR manual 4. Check for captured data completeness	1. Completed CRF form 2. Client CBS information captured in the EMR

	5. Facility CBS Coordinator ensures 100% EMR use and capture of all current and backlogged patient information.	
District CBS TOTs	1. Collection and proper storage of paper based CRF forms 2. Capturing of CRF forms into the District Health Information Software (DHIS2) 3. CBS data review meetings with health facilities 4. Train facility staff on CBS activities and requirements using tools provided. 5. Assess the need for refresher trainings and provide support as needed	Clients and all their sentinel events captured on DHIS2 and EMR
MOHW and Implementing Partner- M&E Team	1. Check variables completeness before analysis. 2. Communicate with facilities to correct any errors identified by the data analysis and Health Informatics (HI) teams using data quality tools 3. Communicate with National Data Warehouse (NDW) and Data analysis team to provide updates from health facilities 4. Provide Technical Assistance (TA) on CBS activities 5. Provide refresher training and CBS support as needed	Data management reports
MOHW and Implementing Partner- HI Team	1. Extraction of data from the NDW as documented in standard operating procedures (SOPs) 2. De-duplication of dataset according to predetermined documented processes 3. Migration of de-identified dataset into the CBS DHIS2 instance 4. Minimize the risk of data loss in the CBS DHIS2 system 5. Dashboards and data visualization in collaboration with analysts 6. Trouble shoot any HI related issues in a timely manner	1. Complete de-duplicated CBS data migrated into DHIS2 and in other formats (Excel etc.,) 2. Dataset backups of the CBS dataset 3. CBS dashboards in DHIS2

MOHW and Implementing Partner- IT Team	1. Ensure 24/7 availability of the CBS DHIS2 system 2. Ensure secure data transmission from facilities within the CBS DHIS2 system 3. Ensure adequate data storage capacity in the CBS DHIS2 system 4. Ensure acceptable performance of the CBS DHIS2 system	1. CBS DHIS2 accessible always when needed, production of downtime reports. 2. Encrypted network traffic in the CBS DHIS2 system, intrusion detection reports. 3. CBS server storage capacity monitoring and reports 4. Quick response time of the CBS DHIS2 system to users
MOHW and Implementing Partner- Data Analysts	1. Data Analysis 2. Report writing	1. Data analysis & management reports 2. CBS Ad Hoc , Quarterly and Annual reports
CBS Master Trainers/TWG	1. Train district TOTs including refresher trainings as needed 2. Review CBS data regularly and provide feedback to district TOTs 3. Ensure that CBS activities are being implemented as planned 4. Provide TA at every level – national, district and facility. 5. Orient TOTs to SOPs developed to implement CBS	CBS feedback reports

2.2 Capacity Development for CBS

HIV CBS training will cascade to the facilities through the district TOTs, working closely with the CBS Master Trainers [*Appendix 2*]and other CBS TWG members. HIV CBS Master Trainers were identified by the MOHW SO and are comprised of Program Officers, HI staff, Information Technology (IT) staff and Monitoring and Evaluation (M&E) officers from both MOHW and Implementing Partners. District training was clustered to include several districts being trained together. District TOTS were identified in close collaboration with DHMT coordinators and are

comprised of individuals who are involved in care of PLHIV along the entire cascade. E-learning tools will be provided for CBS TOTs to encourage continuous learning and facilitate roll out of CBS in the facilities. Standard Operating Procedures (SOPs) have been developed to facilitate the implementation of CBS.

3. HIV CBS Design and Components

Below is a graphic representation of the components of HIV CBS.

Figure 1. CBS Components

3.1 **HIV Case Definition**

For the purposes of HIV CBS, a case refers to an individual with a confirmed diagnosis of HIV and has adequate unique identifying information. To be able to follow an individual, it is important to capture all HIV case information, including: surname, first name, middle name if available, date of birth, sex at birth, date of first positive test and a unique identifier e.g., Omang for citizens of Botswana, a birth certificate number or passport number for non-citizens.

Case definitions:

(1) A newly diagnosed HIV case:

- An individual who has a confirmed diagnosis of HIV infection using the national testing algorithm according to a national HIV case definition.

(2) Mother-to-child HIV transmission case:

- Aged <5 years
- Had a confirmed diagnosis of HIV infection using a national testing algorithm for individuals aged ≥18 months, and for children aged <18 months); and
- Their mother was HIV-positive during pregnancy or breastfeeding

(3) A TB case: An individual who meets the following criteria:

- Has a confirmed diagnosis of TB disease using a national clinical evaluation algorithm; or
- Has a confirmed previous diagnosis of TB that was treated

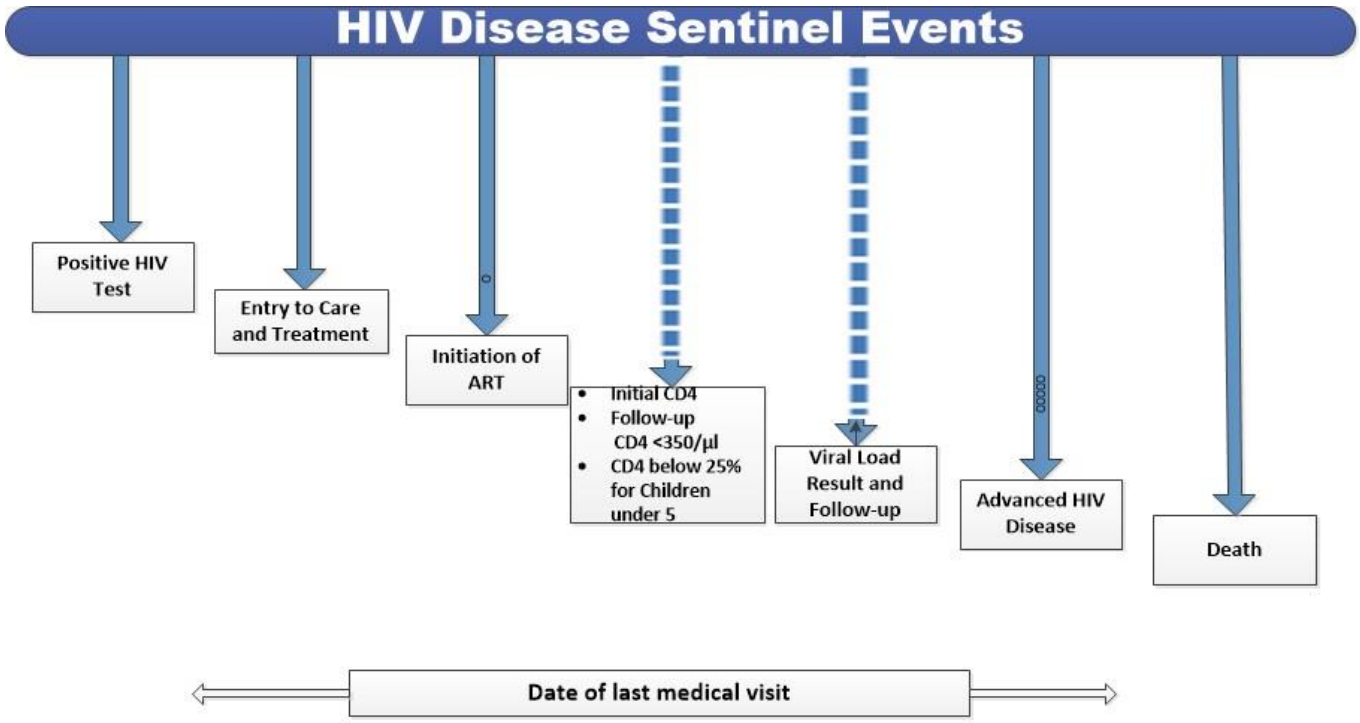
3.2 **Definition of Sentinel Events**

The sentinel events for case-based surveillance in Botswana include HIV diagnosis, initial, and follow up CD4 count results, initial, and follow up viral load results, Antiretroviral therapy (ART) regimen including changes to 2nd and 3rd line regimen, tuberculosis (TB) preventive treatment (TPT) and TB diagnosis and death. A confirmed HIV positive test determines an HIV case and is the initial event for HIV case-based surveillance.

HIV CBS in Botswana will have more sentinel events than the minimum required by WHO minimum sentinel shown in Figure 2 below. Additional events to be collected include the following:

- Treatment status such as stopping, defaulting, Lost to follow-up (LTFU) and transfer-out
- Treatment switch (change in treatment regimen)
- Drug resistance
- Recency test
- TB and TPT status
- Pregnancy, and birth outcomes

Figure 2. HIV Sentinel Events



NB: Dotted lines shows repeated events

Table 2. Description of HIV Sentinel Events

SENTINEL EVENT	DESCRIPTION	REQUIRED VARIABLES
HIV DIAGNOSIS	First or earliest HIV diagnosis. Clients who received HIV testing services and have a confirmed positive test result.	First Name, Surname Name HTS test/visit Date Sex at birth Date of birth/Age Risk category – Key Populations (KP) Age District
1ST AND FOLLOW UP CD4 CELL COUNT RESULT	Initial CD4 cell count test result and all follow up results	Sample Collection Date CD4 Count Result CD4 Test Date HIV Diagnosis Date Age/date of birth (DOB) Sex at birth
1ST AND FOLLOW UP VIRAL LOAD RESULTS	Initial VL conducted following HIV diagnosis and a confirmed HIV positive result. All follow up VL results	Sample Collection Date Lab result description ART Start Date Last drug pickup
LINKED TO CARE	Patient linked to care following HIV diagnosis	IDCC Registration Date Date of HIV Diagnosis
ART INITIATION	Enrollment of patient into ART following HIV diagnosis	ART Start Date Date of HIV Diagnosis
ATTRITION	Dropped out of treatment after having a record of treatment initiation	District Sex Drug pickups Stopped Treatment Date Stopped Death Date Deceased Transferred Out Date Transferred Out
TB TREATMENT AND DIAGNOSIS	TB Status of patient	TB Status Initial TB Status Clinical TB Screenings
TPT Status	Started TPT Completion status of TPT	TPT Start Date TPT End Date
WHO CLINICAL STAGING	WHO Clinical Stage	WHO Clinical Stage HIV Diagnosis Date Information collected from all PLHIV Sex, Age
DEATH	Confirmed death of patient associated with the facility at any one point. Underlying cause of death if available	Date of Death District Sex at birth ICD code

4. Data Sources

Data for CBS in Botswana will rely on systems and processes that are currently in place for collecting HIV care and treatment services data, including HIV testing services and laboratory information, for each PLHIV and include the following. to capture patient information.

- The Integrated Patient Management System (IPMS).
- The Patient Information Management System (PIMS).
- Manual Patient Registers.
- Manual Patient Encounter Forms.
- HIV Testing Registers.
- Laboratory Reports.

4.1 **Electronic Medical Records**

Approximately 85% of 564 MOHW facilities use one of two EMR systems, IPMS or PIMS. Data from these EMRs are stored at the NDW.

PIMS

Since 2007, with support from the PEPFAR, through the Centers for Disease Control and Prevention (CDC), PIMS was developed and is now being used at 410 health facilities (as of September 2019). PIMS is a standalone application that runs through a client server architecture in a health facility. PIMS was designed to collect clinical data longitudinally from HIV testing services (both HIV positive and negative), repeat testing, index testing including the final HIV status of HIV-exposed infants linked with the mother, ART initiation, and all clinical services (symptoms, laboratory test results, and others).

At each facility, all paper-based forms/registers are translated into an electronic form, and all information is entered at each service point using a computer in which the PIMS application is installed. At clinic level patients are identified using a "client unique identification," which is either (1) the national identification number (Omang)/birth certificate or passport number (non-citizens), or (2) a pseudo-unique identification number generated from within the application. All information is documented per each clinic visit. In 2018, the government of Botswana (GOB) initiated support for expanding PIMS nationally. Access to PIMS is through a username and password. User privileges are assigned to the account to ensure that the user is only able to access the assigned modules/functionality.

IPMS

IPMS is a proprietary software developed and maintained by MedTech. IPMS is used in 28 district/primary hospitals and 18 high-volume clinics with maternity services. The system was designed to support clinicians and managers in managing clinical care for patients (inpatient and outpatient) including HIV care and treatment programs from the point of ART initiation, clinical

visits, laboratory tests/results, ARV refill services, and referral services. All information is documented per each clinic visit and linked longitudinally using unique identifiable patient information which is either (1) the national identification number (Omang) or passport number (non-citizens), or (2) a pseudo-unique identification number known as the CM (Care Management) number . All medical records entered in IPMS are linked across clinics using the same system. Since the system doesn't have an HIV testing services (HTS) component, facilities with IPMS record all HTS and index testing, including mother-baby pairs, in paper-based registers. All laboratory testing requests and results are entered in IPMS (e.g., PCR, CD4, viral load, etc.).

IPMS has a centralized database within the Government Data Network (GDN) that is linked to the NDW and is not accessible from outside the GDN. Therefore, to access IPMS, a user must have a domain account in the GDN. This requires a username and password, both of which are managed by the Department of Information Technology (DIT). Multiple layers of security are embedded to ensure confidentiality of patient data. Both the client and server-side reside on the GDN, they are therefore subject to the network security implementation applied by the DIT across the GDN.

DHIS-2

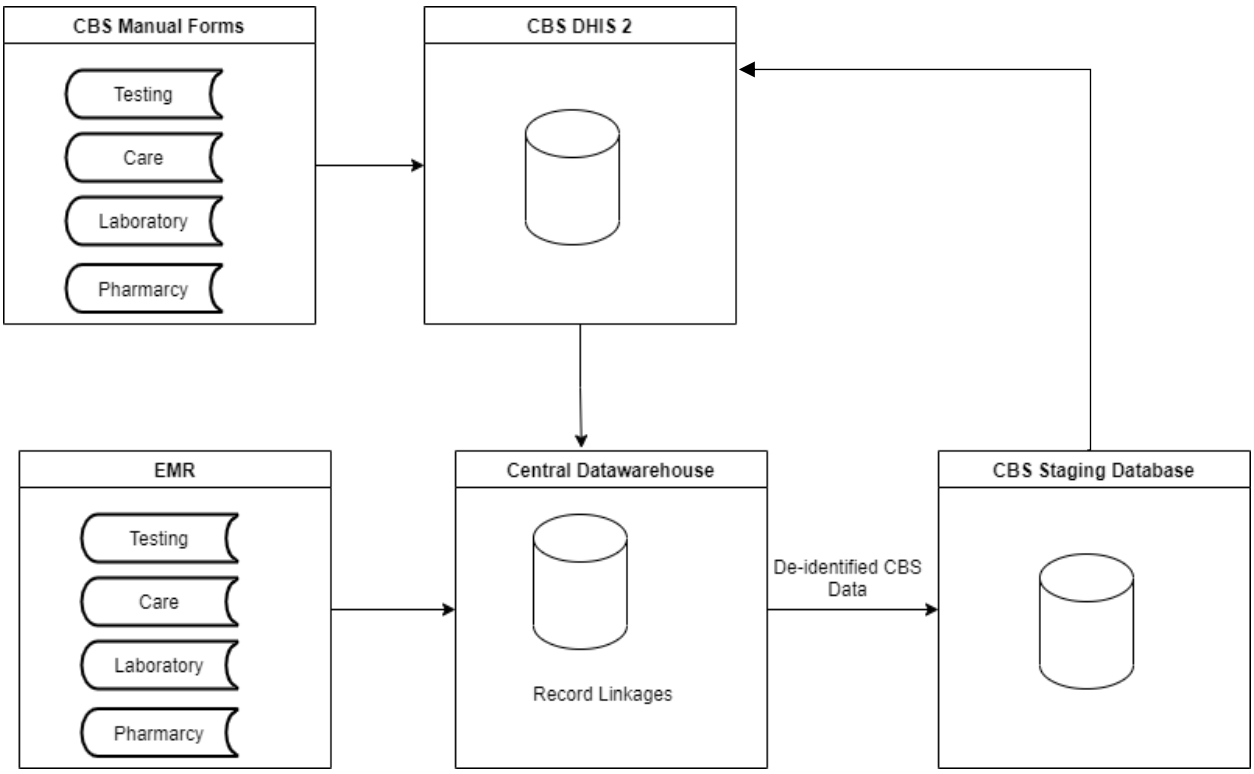
Where there is no EMR, a paper- based CRF [*See Appendix 3A and 3B*] and DHIS2 Tracker Capture will be used to collect and send data to the NDW. All such facilities are to use the paper based CRF, but the DHIS2 Tracker will only be installed at centralized mother facilities in which all CRF forms are sent for capture.

5. Data Processes for HIV CBS

5.1 **CBS Data Flow**

The figure below depicts the flow of data from EMR or non-EMR facilities.

Figure 3. HIV CBS Data Flow



5.2 **Data Collection**

Trained health care workers will collect data using the EMRs. Training manuals and guides are available for the two primary EMRs described above.[6,7]

This document provides additional guidance on how to complete the paper CRF and how to enter the information from the paper CRF into DHIS-2 tracker.

The following steps describe the process of completion of the CRFs, it refers to both CRF for the newly diagnosed cases and for capturing subsequent sentinel events

1) The CRF for newly diagnosed persons living with HIV [*Appendix 3A*] is used to capture information on an individual following a verified new positive HIV diagnosis at the various testing points.

2) The CRF must include enough information for the surveillance program to describe the HIV epidemic according to person, place, and time.
3) A completed CRF form must include:
   a) Client Unique Identifiers and Client Demographics section must all be completed with "Not Available" ticked if the information is truly not available.
   b) Facility Information section must all be completed.
   c) Index Testing section must be completed and only use NA if information is truly not available.
   d) HIV Testing section must all be completed.
   e) Either Client Clinical History (Age < 5) or Client Clinical History (Age > 5) must all be completed.
   f) For all other sections, tick "Not Done" if the section was not done, if it was done complete all variables collected in that section.
   g) Client clinical information at time of HIV diagnosis must be completed.
   h) Data Management Section must all be completed.

4) The CRF will be completed by abstracting information from service registers, patient charts and various standard national tools.
5) Data elements from these tools will be mined to generate a CRF for each client.
6) Newly diagnosed pregnant mothers and DNA-PCR positive exposed infants, at ANC/PMTCT clinic, will have their CRFs generated from the ANC and PMTCT cohort registers, since all the required information for the HIV case report is contained in these registers.
7) See [*Appendix 4A&B*] for full description of the CRF data elements and how to complete both CRFs.
8) CRF form is **NOT** to be completed when the client is at the facility getting HTS or ART services, and it does not replace any currently used patient register or file.

5.2.1 Guideline for Completing CRFs

Table 3. Completing CRF Guideline

Items	Description
Who should fill the CRF	The healthcare auxiliary (HCA), data clerk or any assigned facility staff completes the relevant CRF and this will be transcribed to an electronic form on DHIS-2.
When to fill the form	The CRF form is filled daily, immediately a new HIV case is identified or after a routine clinical visit for a known HIV positive client
Submission **due date** and timeline	Bi-weekly to mother facility or DHMT
Where to send the completed report	Identified mother facility or DHMT
Where to **store** the completed form	The CRF should be kept securely in a file cabinet that is accessible to only authorised persons/staff at the service delivery points or designated location. Electronic copy to be completed on DHIS2
Source of information	Various patient registers

Submitting a Case Report Form (CRF)

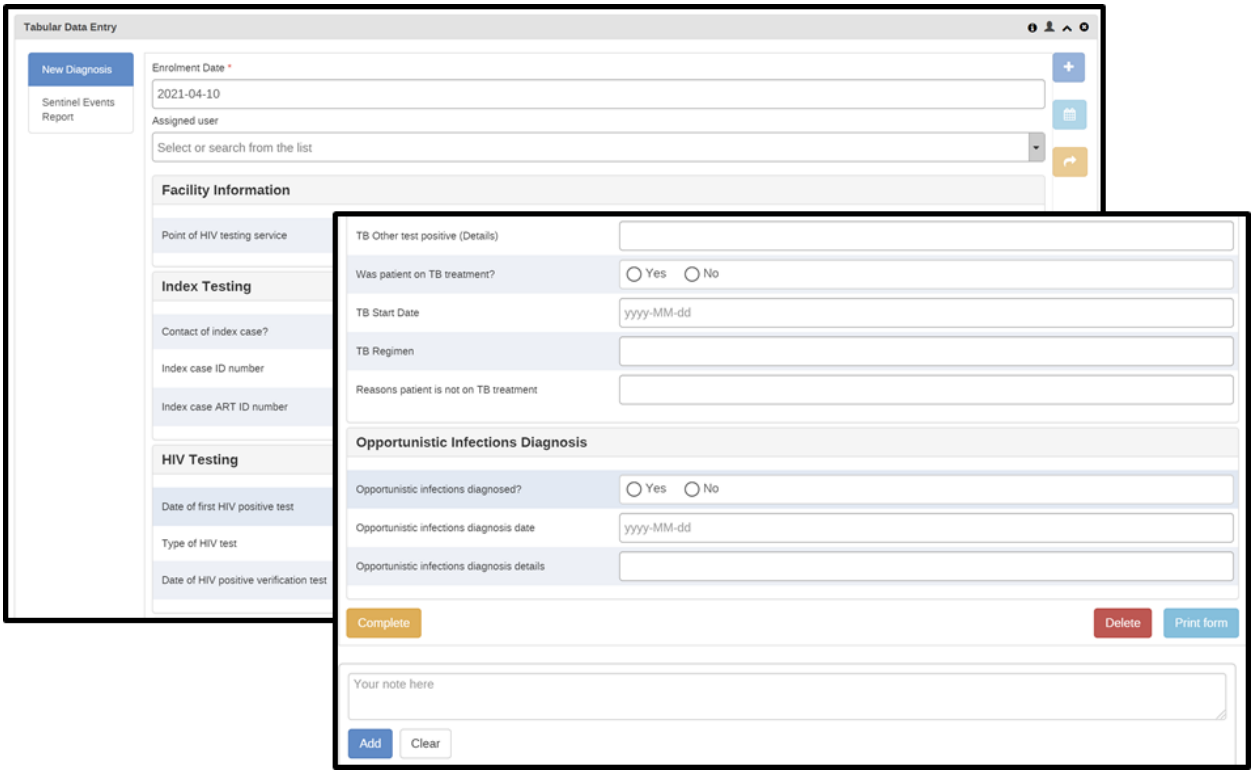
CRFs will be submitted bi-weekly by the designated facility staff to a designated mother facility. They may also be submitted to the district M&E officer or CBS TOT in sealed envelopes for entry into a designated computer/tablet with a web based DHIS2 Tracker that links to the NDW. Existing channels used to move paper documents will be used. A Chain of Custody form [*Appendix 5*] will be completed to document the hand over process. Each CRF will be kept at the facility in a secure cabinet for at least three months before destruction by the district CBS TOT. The CRF is kept allowing time for data entry and verification; after three months, the forms will be collected and destroyed by the district CBS TOTs.

Capturing CRF on DHIS-2

Completed CRF forms are to be captured into DHIS2 at designated facilities or location by authorized personnel with access to DHIS2.

1. Retrieve Completed CRF forms from their secured cabinets as scheduled.
2. Capture all information on the CRF form into DHIS2. (See DHIS2 Job Aid for full steps-)
3. When done with each CRF form, complete the “Data Management” section, indicating the “Date the Report was Entered”.
4. Return all CRF forms captured in DHIS2 to their secure cabinets for storage for three months before their destruction by shredding.

Figure 4. Capturing Sentinel Events on DHIS-2



5.3 **Data Extraction**

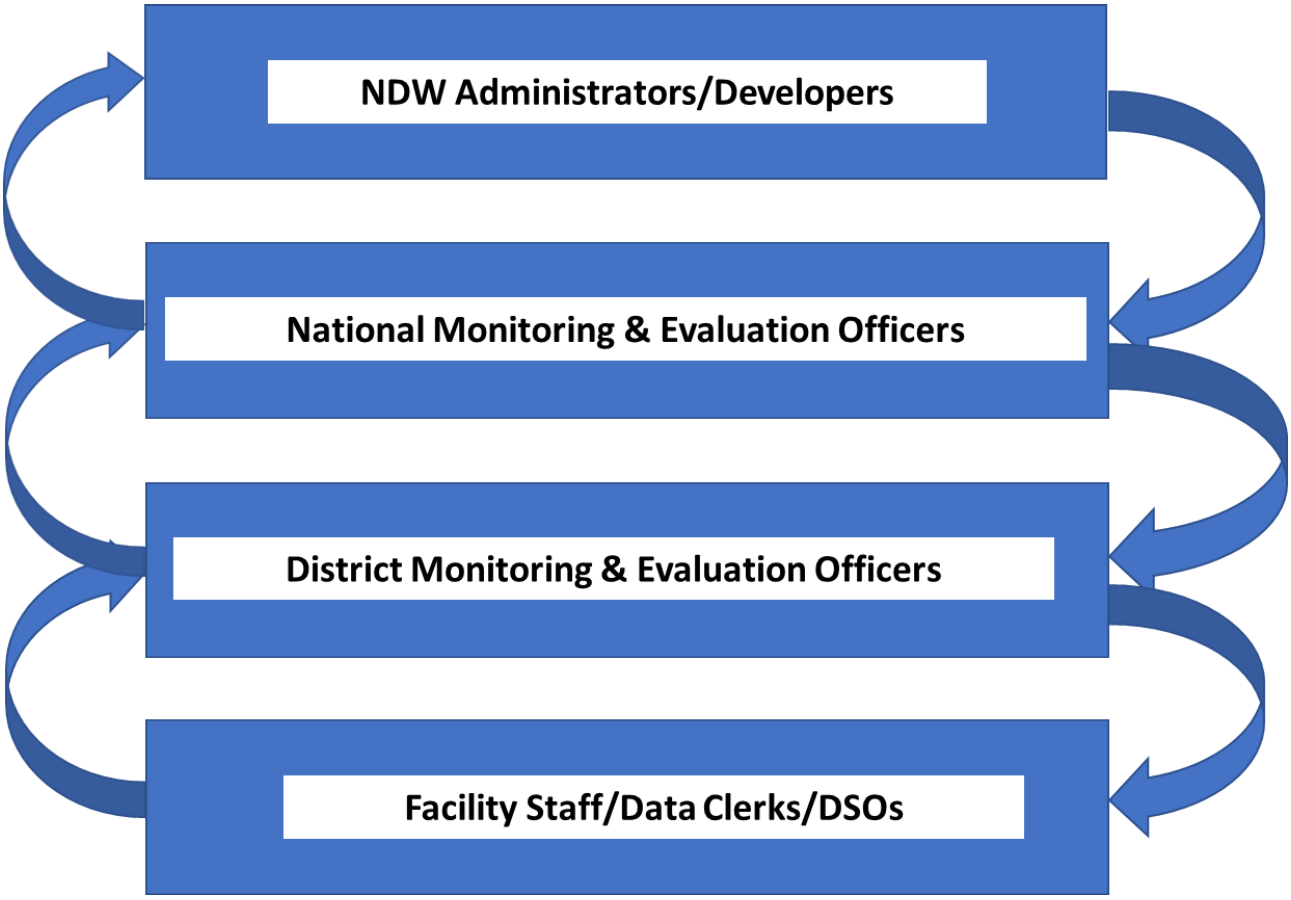
NDW administrators and software developers are responsible for extracting data from the NDW into the CBS dataset. The CBS analytical data set will be generated from the NDW and will cover all sentinel events needed for the CBS. These data elements are also provided in the data analysis SOPs.

5.4 **Data Management**

Data management processes for CBS will include data quality monitoring, which will involve data audits with a feedback mechanism embedded to ensure data quality improvement. Detailed processes are described in the CBS Data Management SOP.

This document will focus on the describing the feedback loop with health facilities as depicted in Figure 5 below:

Figure 5. Data Flow



The two key processes are described below:

Sharing Identified data Issues with health facilities:

- The national M&E officers share identified CBS data issues with the district M&E officer separated into active and inactive clients for facilities to prioritize active client's issues and with instructions defined— e.g. issues are highlighted in yellow color—and the Data Support Officers (DSOs) are to highlight in green when they have fixed the issue on the EMR and highlight in blue when the issue is already up to date on the system (this is to help improve data extraction from NDW).
- The district M&E officers then shares the identified CBS data issues with the facilities and data clerks to attend.
- Give feedback to the NDW administrators, where the issues identified are not seen as issues at the EMR system and if the dataset is inconsistent.

Feedback:

- Develop a feedback tool or use one that is currently in use [*Appendix 6: Data Issues Feedback Reporting Tool*] to communicate the achievements, challenges, way forward on identified data issues at all levels.
- The CBS data manager compares the previous CBS report with the latest CBS report on progress made using data quality monitoring reports and dashboards.
- National M&E officers compiles and shares progress report from districts on identified data issues and report to the management on weekly basis.

Support and Mentoring on Data Quality:

- The national M&E officers follows up to monitor the data cleaning process with district M&E officers.
- The national M&E officers will do planned and unannounced site visits to districts by also prioritizing districts with high data issues identified to ensure capacity building and transfer of skills.
- The national M&E officers will also conduct virtual meetings, attending to issues facilities face when resolving data quality issues and sharing best practices.

Data Quality Improvement

The following steps detail how the data quality improvement (DQI) will be carried out to ensure quality data is collected from the manual patient files to the EMR systems and eventually to the NDW. The DQI process will be completed at both facility level and national level by the data clerks and M&E officers.

Facility level

1. The data clerk officer will randomly select active patient files from the cabinet, a minimum of 10 to 50 files depending on the size of the facility.
2. The data clerk will then check selected variables for consistency on both the patient file and the EMR system.
3. These variables may include but not limited to patient demographics, identifier, HIV test date, initiation date, recent cd4, recent VL, last clinical data and next appointment date.
4. The data clerk will tally the results showing consistent and inconsistent recordings and identify any possible causes for remediation.
5. All the variables checked for consistency between the patient file and the EMR system should be similar, or the EMR should have more up to date documentation.
6. The data clerk also calculates the selected indicators to check for consistency, e.g. initiations for the specific period (the data clerk will tally if the newly initiated clients are correctly captured as such on the EMR system and record any data quality issues identified).

5.5 Data Analysis and Dissemination

5.5.1 Data Analysis Team

Data analysis will be conducted by the MOHW surveillance officer or their designee with support from implementing partners (IP). The team will analyze HIV case surveillance data to broadly answer key questions related to who is bearing the burden of HIV disease, who is contributing to new HIV cases, what the progression of disease and mortality for those diagnosed with HIV, and how are the cases distributed. The data analysis team will guide the development of the CBS data analysis plan and will guide the NDW team on developing dashboards for visualizing CBS data. The team will prepare and submit quarterly and annual CBS reports to the TWG and identified stakeholders.

5.5.2 Data Analysis Plan

The data analysis team will conduct data analysis on an extracted CBS dataset to produce quarterly and annual reports based on a pre-defined CBS indicator algorithm and CBS data dictionary. The CBS dataset will be updated at least quarterly and more frequently if needed for ad hoc reports.

5.5.3 Data Use and Dissemination

The following means shall be used to disseminate CBS reports and data quarterly and annually:

- Stakeholder consultation forums.
- Abstracts, manuscripts, and publications in journals.
- Publish aggregate data, no PII
- Data review meetings at the district.
- Conduct quarterly data review meetings at the district level as guided by the phase of implementation as outlined in the CBS Implementation Guide.
- CBS TWG meetings:
    - Conduct quarterly data review meetings at which data will be reviewed, challenges discussed, and lessons learned are shared.
    - Data Use TWG: Make CBS presentations during the data use TWG

5.6 Data 2 Care

CBS data will be used to investigate loss to follow up and linkage to care. Clients who appear to not be receiving HIV medical care according to the CBS data will be contacted by facility or

community partners to be reengaged in care. Since the CBS data does not include personal identifiable information (PII), the list of people out of care will be sent to the NDW where the link to the identifying information is stored. The list of people out of care will then be shared with the appropriate partners for further investigation in accordance with established data sharing agreements between partners. Health care workers will provide feedback on outcomes of their investigations.

6. Ethics, Security, and Confidentiality

6.1 **Ethics**

To minimize the risk of a breach of confidentiality and disclosure of individual level information (e.g., HIV status), human, physical and electronic procedures and protections will be in place to ensure the confidentiality and security of personal information. All persons handling client surveillance data will be trained or retrained on good clinical practices and required to sign a Confidentiality Agreement [*Appendix 7*]. Case-based Surveillance activities will uphold individual rights to privacy and confidentiality.

6.2 **Security**

The CRF can be completed retrospectively or in real-time depending on the clinic and implementing phase. Once implemented, the CRF will be completed at the time of HIV diagnosis by site-level staff (e.g., counselor, nurse, or clinician using a paper-based form or electronic form). For sites using EMRs, case data will be updated at each clinic visit and transmitted to the NDW on a monthly basis. For sites using paper based CRFs, the completed forms will be stored in locked/secure cabinets in facilities with access restricted to only authorized individuals. The forms will be submitted on a weekly basis to a designated clinic or the district M&E officer in sealed envelopes for entry into a designated computer/tablet with a web based DHIS2 Tracker that links with the NDW. The paper-based form will be kept in a secure location for three months to allow time for data entry and verification; after three months, the forms will be destroyed.

All client surveillance data will be encrypted during data transmission to ensure the privacy and security of client information. The surveillance database will be placed in a secure location at the national level, with access restricted to authorized personnel only. People authorized to access personal identifying information at the sub-national level will have rights to access de-identified sub-national specific data for their surveillance requirements. All data analysis will be done using de-identified data. Published reports will not contain any PII.

Security is built into the GDN to protect data that are transferred over the GDN to the NDW (i.e., IPMS, PIMS, DHIS2 database). The GDN is managed by the DIT at the Ministry of Transport and Communications on behalf of all Government of Botswana ministries. Network level security on the GDN through firewalls, intrusion detection and prevention and other tools are the exclusive purview of the DIT. Access control is implemented by the DIT in the GDN through managing users' authentication and authorization for accessing resources within the network. GOB employees, therefore, access the GDN as per their assigned privileges. Access to specific software applications is also managed by super-users of that application with DIT. The DIT has seconded IT Officers to all Ministries including MOHW who are responsible for managing the IT infrastructure, networks, and other IT services within the Ministry. The NDW and CBS servers are in a secure locked location in the MOHW. Access to the servers is limited by user ID and password protection to designated staff. Access to specific program modules is limited to designated program staff; access to read data or access to read and to write data is defined in

the Data Management SOP. Confidential data within the data servers are encrypted. Unique ID and other PII will only be accessible to staff with data management responsibilities for matching and de-duplicating records.

6.3 **Confidentiality**

In order to protect the privacy, confidentiality, and security of patient information and electronic health records in the HIV CBS system, all users at every level of the system must understand, accept, and sign the Confidentiality Agreement document. Users must electronically sign the pledge before they use the CBS system. This signed and completed document will be kept on the CBS database at the facility and hold HIV CBS users accountable for their respective rights and responsibilities when using the system.

7. Monitoring and Evaluation of the HIV CBS System

7.1 **Routine Monitoring**

All personnel involved in HIV case reporting will be trained on the CRF, reporting procedures and requirements, data security, and protecting the confidentiality of clients using the SOPs developed for this purpose.

While implementing the surveillance system, assessments of the completeness, timeliness, accuracy, validity, and representativeness of data collected should be conducted routinely. The principal investigators, or his/her designated investigators and survey managers, will contact the survey clinic nurse in charge as well as conduct site visits periodically (official and spot check in combination with other trips) to make sure the fieldworkers follow the data collection procedures; all files will be stored properly at the health facility according to the approved protocol.

7.2 **Sponsor Monitoring**

As the project sponsors, the CDC, together with MOHW staff and MOHW Institutional Review Board will conduct case surveillance activation before the surveillance data are collected and generated making sure all data security and confidential procedures are in place as stated in the protocol before data collection. During implementation, monitoring, or auditing surveillance activities to ensure the scientific integrity of the surveillance system and to ensure the rights and protection of study participants will be conducted.

7.3 **Evaluation of CBS System**

An evaluation of the system will be conducted annually to assess if it is truly capturing HIV case including all sentinel events after diagnosis. Such an exercise may result in program implementation adjustments or even a complete overhaul of the program or system.

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4. Botswana Ministry of Health and Wellness (2013). Public Health Act of 2013 (111(b))
5. National AIDS and Health Promotion Agency. The third Botswana national strategic framework for HIV & AIDS 2019-2023: Enhancing efficiencies through an integrated approach "Phenyo ka 2030"
6. Botswana Ministry of Health and Wellness. PIMS Training Manual. (2013).
7. Botswana Ministry of Health and Wellness. IPMS Training Manual. (2017).

Appendices

Appendix 1: List of CBS District TOTs

Cluster	District	Name	Organization
	Jwaneng	Obakeng Banantwa	DHMT - Jwaneng
		Boitshoko Ntuanyane	DHMT - Jwaneng
		Onalenna Thebeyadira	DHMT - Jwaneng
		Kealeboga Sannawane	DHMT - Jwaneng
		Bathusi Balapile	DHMT - Jwaneng
		Gofemaone Segomotso	DHMT - Jwaneng
	Kanye	Tebogo Taolo	DHMT - Kanye
		Constance Keitumele	DHMT - Kanye
		Kesegofetse Mothibakgomo	Kanye Main Clinic
		Keletso Ramokgwana	DHMT - Kanye
	Mabutsane	Philip Pheko	DHMT- Mabutsane
		Elijah Keikanne	DHMT- Mabutsane
		Mothusi Molefakgomo	DHMT - Mabutsane
	Moshupa	Kealeboga Ketlogetswe	DHMT - Moshupa
		Goitseone Fiona Moses	DHMT- Moshupa
		Modiri Monakwane	DHMT - Moshupa
	Kgalagadi North	Bonkagetse Ithuteng	DHMT - Kgalagadi North
		Esther Matengu	Kang Clinic
		Gabobofane Maphakwane	DHMT - Kgalagadi North
		Maitseo Duduetsang Mojela	Hukuntsi Primary Hospital
	Kgalagadi South	Boitumelo Monnahela	Tsabong P. hospital
		Kabo Lekhutule	Makopong Clinic
		Mphoentle Dekoker	Tsabong P. hospital
		Setlalekgosi Sentlabane	Middlepits Clinic
	Goodhope	Daniel Ezika Maruping	Goodhope DHMT
		Merapelo Mpuang	Goodhope DHMT
		Reetsang Morake	Goodhope DHMT
		Utlwanang Rampupunyane	Goodhope P. Hospital
	Lobatse	Kabo Dennis Nnini	Tsopeng Clinic
		Kefilwe Molaodi	Athlone Hospital
		Maranyane Kefentse	Athlone Hospital
		Tiny B. Modise	Lobatse DHMT
	South East	Agnes M. Ramhitshana	Ramotswa DHMT
		Linda Baganne	Lesetlhana Clinic
		Onneetse Isaiah	Ramotswa DHMT
		Josephine Moremi	Mogobane Clinic

	Tutume	Dikeledi Osadi Lekang	Tutume DHMT
		Obonye Matone	Dagwi Clinic
		Onkgomoditse Phodiso	Tututme P. Hospital
		Christopher Thebe	Tutume DHMT
	Chobe	Goitsemodimo Sera Matshela	Chobe DHMT
		Bernard Mawa	Kazungula Clinic
		Botlhokwa Prince Kombani	Chobe DHMT
	Boteti	Onalethata Serumola	Boteti DHMT
		Baitshenyetsi Baitshenyetsi	Letlhakane P. Hospital
		Kebadiretse Poloko	Rakops P. Hospital
	Mahalapye	Kago Rabosigo	Sefhare P. Hospital
		Keitumetse H Kolobe	Mahalape Hospital
		Boipelo Pheto	Mahalape Hospital
		Lebang Modisaotsile	Xhosa Clinic
	Kweneng East	Gofaone Filipo	Kweneng East DHMT
		Tselayaone Lesetedi	Thamaga Hospital
		Adelaide Oathotse	Scottish Livingstone Hospital
	Kweneng West	Kealeboga Dennis Makwati	Letlhakeng Clinic
		Linkie Ralemune	Moshaweng Clinic
		Nametso Segokgo	Moshaweng Clinic
		Frankel Bontsi	Sesung Clinic
	Gaborone	Molaodi Bakang	Greater Gabs DHMT/Taung Clinic
		Obuile Makwati	Greater Gabs DHMT/South East
		Tshegofatso Moemedi	Greater Gabs DHMT/Khayakholo Clinic
		Kelebogile Pinkie Maseng	Greater Gabs DHMT/CHBC Office
		Chawapiwa B Zwinila	MoH HQ
	Kgatleng	Edwin Sebopelo	Mochudi Clinic
		Clifford T Chawe	Phaphane Clinic
		Tshepo Kabo Kwapa	Boseja 1 Clinic
	Selebi Phikwe	Daniel Taolo	Kagiso Clinic
	Bobonong	Marea K Sebola	Kobojango Health Post
		Ogomoditse Mothobi	Molaladau H Post
		Mooketsi Mathake	Mabole H Post
		Samuel Oatlhotse	Manga Clinic
	Mmadinare	Molaodi Masike	Mmadinare Hospital
	Palapye	Gofaone Phuthego	Palapye DHMT/Kediretswe Clinic
		Magdeline Kamanga	Palapye Hospital
		Godwill Mudongo	Palapye Hospital
	Serowe	Thobego Mbodze	Serowe DHMT
		Kabelo Seloka	Serowe DHMT/Moiyabana Clinina

		Matsobane Alex Matlou	Sekgoma Hospital
	Okavango	Nkidi Machaba	Okavango DHMT
		Lizzy Gofaone Mogomotsi	Etsha 6 Clinic
		Malebogo Kehakgametse	Okavango DHMT
		Tshekoetsile Keesi	Shakwe Clinic
		Walter K Ovoya	Tubu Clinic
	Ngami	Cindarella Gaebowe	Letsholathebe Hospital
		Bernard Khomba	Maun General Clinic
		Bontle Ntshonga Maano	Matshwaane Clinic
		Goweditswe Tshelametsi	Letsholathebe Hospital
		Tsholofelo Dikoma	Boseja Clinic
	Francistown	Lamodiso Modie Malope	Greater Francistown - DHMT
	North East	Phemelo Kelebeletse	North East - DHMT
		Rubben Sanane	North East - DHMT
		Mpinyane Mpinyane	North East - DHMT
		Kagiso Muzangwa	North East - DHMT
	Gantsi	Tshepiso Ndebele	SHAA Clinic
		Christinah G. Sebabi	Morama Clinic
		Tshepo M. Matshego	Gantsi DHMT
		Abel Chunga	Gantsi Clinic
		Nancy Kandu	Gantsi P. Hospital
	Charleshill	Abednicoh Dibani	Charlsehill Clinic
		Boikobo Mosikwa	Charleshill
		Gaboboloke Dikathoko	Charleshill
		Elsie Ghaakhwe	Charleshill
		Godiraone Kebonyemptse	Ncojane Clinic
	Bummhi	Margaret Konju	Bummhi - Mahalapye
		Amantle T Moakofi	Bummhi - Mahalapye
		Tshepo Elijah	Bummhi - Mahalapye
		Mogogi Sethako	Bummhi - Mahalapye
		Bathusi Rampupunyane	Bummhi - Mahalapye
		Bokamoso Maikano	Bummhi - Francistown
		Tebogo Rantsi	Bummhi - Francistown
		Itseng Bosulafetse	Bummhi - Francistown
		Agisanyang Kolagano	Bummhi - Francistown
		Kutlo Moeng	Bummhi - Francistown
		Andrew Dihutso	Bummhi - Francistown
		Angel Nkau	Bummhi - Francistown
		Kealeboga Chako	Bummhi - Francistown
		Lorato Thato Tshukudu	Bummhi - Francistown

	Bummhi	Tshegofatso	Bummhi - Francistown
		Eunice Modisenyane	Bummhi - Francistown
		Tlotlo Mothei	Bummhi - Francistown
		Halima O Motlogelwa	Bummhi - Francistown
		Kago Nkokoto	Bummhi - Francistown
		Kegeletse Gaenengwe	Bummhi - Francistown
		Boga Mhlanathi	Bummhi - Francistown
		Ompatile Gobuiwang	Bummhi - Gaborone
		Mompoloki Kenaope	Bummhi - Gaborone
		Nametso Modise	Bummhi - Gaborone
		One Mogaetsho	Bummhi - Gaborone
		Nonofo Moeng	Bummhi - Gaborone
		Wangu Mabutho	Bummhi - Gaborone
		Oratile Joshua	Bummhi - Gaborone
		Khumo Thamage	Bummhi - Gaborone
		Tlhongbotho Gabonthone	Bummhi - Gaborone
		Shatiso Fumani	Bummhi - Gaborone
		Boithumelo Nfila	Bummhi- Kweneng East
		Portia K Nyathi	Bummhi- Kgatleng
		Ivy Bakane	Bummhi- Kweneng East
		Keineetse Kobue	Bummhi- South- East
		Olorato Gaonewe	Bummhi – South East
		Bonolo Nkwe	Bummhi - Gaborone
		Neo Moatshe	Bummhi – Kweneng East
		Gaone Segokgo	Bummhi - Gaborone
		Edwin Willie	Bummhi - Goodhope
		Baboloki Maplanka	Bummhi - Kgatleng
		Ogaisitse Mpolokang	Bummhi - Kanye
		Ikanyeng Ratie Morena	Bummhi- South East
		Tlotlo Batsalelwang	Bummhi- Kweneng East
		Keotshepha Makepe	Bummhi - Moshupa
		Henry Issacs	Bummhi - Gaborone
	Tebelopele Wellness Center	Refilwe Motia Keletso	TWC - Gaborone
		Banyana Piet	TWC - Gaborone
		Shirley Rhynas	TWC - Gaborone
		Lorato Wale	TWC - Gaborone
		Godiraone Mmopi	TWC - Gaborone
		Nametso Mathiba	TWC - Gaborone
		Botlhale Mosadame	TWC - Gaborone
		Onalethata Motshabi	TWC - Maun

		Febby Moeletsi	TWC - Gaborone
		Seako Ranko	TWC - Gaborone
		Olebogeng Molefe-Mpofu	TWC - Gaborone
		Selebatso Idah Mpolokeng	TWC - Francistown
	Humana People to People (HPP)	Watipa Gaogane	HPP - Gaborone
		Kesegofetse Gaolebe	HPP - Gaborone
		Kgomotso Sibiga	HPP - Francistown
	BW Christian AIDS Program	Goitsemodimo Majaha	Bocaip - Gaborone
		Mmoni Setlhare	Bocaip - Gaborone

Appendix 2: List of Master Trainers

Name	Organization
Bolebantswe Jerry	MOHW
Kemmonye Kusi	MOHW
Kefilwe Gobeilweng	MOHW
Kopelang Catherine	MOHW
Leu Leu	MOHW
Lungisani Boingotlo	MOHW
Makuruetsa Penny	MOHW
Moala Leungo	MOHW
Mogomotsi Panky Goabaone	MOHW
Mosweu Rampa	MOHW
Tau Modiri	MOHW
Tema Patrick	MOHW
Tsima Lerato	MOHW
Bene Ntwayagae	MOHW
Phokedi Alicia Polelo	Tebelelopele
Lekhane Tshwetso	Tebelelopele
Bagwasi Tlhalefang	Tebelelopele
Mpho Leonard	Tebelelopele
Okui Lillian	MGIC
Mudanga Mbatshi	MGIC
Ikgopoleng Kaizer	MGIC
Mantu Boineelo	USAID
Lumodi Tebogo	USAID
Kiranga Maina	USAID
Balisi Ralanang	USAID
Duge Sega	USAID
Omari Habib	UMB
Buyu Celestine	UMB

Appendix 3A: Case Report Form for Newly Diagnosed PLHIV Infection (Form: MH 3241 A)

Botswana Ministry of Health and Wellness

Case Report Form for Newly Diagnosed Persons Living with HIV infection

This form is to be completed by a health care provider on the day of HIV diagnosis or within 7 days of HIV diagnosis. Please record all dates as dd/mm/yyyy

Section A: Client Identifier

(Personal identifying information from this section will not be included in the surveillance database)

1. **Name:** Surname: _____ First name: _____ Middle: _____
2. **Place of Birth:** Country: _____ Province/State/District: _____
   City/Town/Village: _____ Ward/Kgotla: _____
3. **DOB**: / / (DD/MM/YYYY)
4. **Contact No**:_____ Next of Kin/Name:_____ Relationship :_____ Contact No: _____
5. **National Identification** (check all that apply):
   National ID (OMANG): _____ Birth Certificate Number: _____
   Driver Licence: _____ Passport Number: _____ Not Available ☐
6. **HIV Care/ART File Number:** _____ Not Available ☐
7. **Index Case Number**: _____ Not Available ☐
8. **CBS Unique Indentifier:** _____
9. **Today's Date:** / / (DD/MM/YYYY)

Section B: Client Demographic Information

1. **Marital Status:** Single ☐ Married ☐ Divorced/Separated ☐
   Widow/Widower ☐ Minor ☐ Co-Habiting ☐
2. **Married: monogamous polygamous** *(circle only one)*
   Current Location:
   District: _____ Village/Town: _____
   Ward/Kgotla: _____ Plot No: _____

3. **Age**: Year(s) Month(s)
4. **Sex at Birth:** Male ☐ Female ☐

Section C: Facility Information

1. **District:** _____
2. **Testing Site Name/Code:** _____
3. **Reporting Site/Code:** _____
4. **Point of HIV testing service where the case was diagnosed:**
   HTS ☐ ANC ☐ Maternity ☐ IDCC ☐ TB ☐
   VMMC ☐ A&E ☐ Inpatient Ward ☐ STI ☐ OPD ☐
   Child Welfare ☐
   Other ☐, Specify:_____

Section D: Index Testing

1. **Contact of Index Case?** Yes ☐ Index case ID number _____ Not available ☐
   Index case ART ID number _____ Not available ☐
   No ☐ Refuse ☐
   (If client aged < 5 years and identified through PMTCT: HTS and ART ID number of the biological mother should be used)

Section E: HIV Testing

1. **Date of First HIV Positive Test (dd/mm/yyyy):** / /
2. **Type of HIV Test:** Rapid Test ☐ PCR ☐
3. **HIV Test Results:** Negative ☐ Positive ☐
4. **Date of HIV Positive Confirmation (dd/mm/yyyy): / /**

Section F: Client Clinical History Information (client aged ≤ 5 years) (MOVE TO NEXT SECTION IF CLIENT IS ABOVE 5 YEARS)

1. **Birth Weight:** ____kg **Gestation at Birth:** ____ weeks
2. **Maternal ART:** Yes ☐ No ☐ Don't know ☐
   If yes, ART initiation: Before pregnancy ☐ During pregnancy ☐ During birth ☐
   After giving birth ☐ Don't know ☐
   ART regimens taken before or during pregnancy or during or after giving birth (list all): _____
3. **Infant ARV Prophylaxis:** Yes ☐ No ☐ Don't know ☐
   If yes, NVP ☐ & AZT ☐ Other ☐ specify:_____ Duration:____weeks
4. **Birth Defects (ICD-10):** Yes ☐ No ☐ Don't know ☐
   If yes, specify_____

Section G: Client Clinical History Information (client aged > 5 years)

1. **Date of Most Recent HIV-Negative Test**: / / or months ago Never been tested ☐
   Don't Know ☐
2. **Ever Been on PREP** Yes ☐ No ☐ Refuse ☐ Unknown ☐
3. **Ever Been on ART** Yes ☐ No ☐ Refuse ☐ Unknown ☐
4. **Ever Done a CD4 test** Yes ☐ No ☐ Refuse ☐ Unknown ☐
5. **Ever Done a Viral Load Test** Yes ☐ No ☐ Refuse ☐ Unknown ☐
6. **Ever Received ARV/ART Prophylaxis to prevent mother to child HIV transmission?**
   Yes ☐ No ☐ Refuse ☐ Unknown ☐
7. **Is the client female ≥12 years of age**: Yes ☐ No ☐
8. **If yes, is she**
   a. Pregnant ☐, *Gestation (weeks)*:
   b. Breastfeeding ☐, Post-Delivery (months): (Up to 24 months)
   c. Not Pregnant or Breastfeeding ☐

Section H: Client Clinical Information at the time of HIV Diagnosis

1. Was the WHO clinical stage assessed?
No ☐ (Go to question 2)
Yes ☐ → Date Assessed: / /
Result: Stage I ☐
Stage II ☐
Stage III ☐
Stage IV ☐

2. 1st CD4 Test Conducted:
No: ☐ (Go to question 3)
Yes: ☐
Sample Collection Date: / /
Sample Test Date: / /
Result Count:
Result Percent:

3. ART initiated
No ☐ → Referral ☐ Refused ☐

Yes ☐
Initiation Date: / /
Regimen: _____

4. Was cryptococcal infection diagnosed?
No ☐ Not done ☐
Yes ☐ → Date / /

Results: CrAg positive ☐
CM/disseminated ☐

5. Was Tuberculosis diagnosed?
No: ☐ → Was TB preventive therapy (TPT) given?
Yes ☐ → Date: / /
Regimen: _____
(e.g., INH, 3HP)
No ☐ → Reason: ☐ Client Refused
☐ Contraindication
☐ Already Completed TPT
☐ No Drug Supply

Yes: ☐ → Date: / /
Symptom Screening Positive ☐
Sputum Positive ☐ Xray Positive ☐
Other test positive ☐, Specify _____
Was the patient on TB treatment?
Yes ☐ → Start Date: / /
Regimen: _____
No ☐ → Why? _____

Not Done: ☐

6. Were any other opportunistic infections diagnosed?
No ☐
Yes ☐ → Date / /
Specify
_____

SECTION I: CRF/Data Management Information

1. Date CRF Completed: / /
Completed by: _____
Contact no: _____
2. Date CRF Received: / /
Received by: _____
Contact no: _____
3. Date CRF Entered: / /
Entered by: _____
Contact no: _____
(DD/MM/YYYY)

Appendix 3B: Case Report Form for Sentinel Events (Form: MH 3241 B)

Botswana Ministry of Health and Wellness

Case Report Form for Sentinel Events for a Previously Reported HIV Case

This form is to be completed by a health care provider during a client's facility visit. Please record all date as dd/mm/yyyy

Section A: Client Unique Identifier/Client Profile

(Personal identifying information from this section will not be included in the surveillance data repository)

1. **Name:** Surname: _____ First name: _____ Middle: _____
2. **Place of Birth:** Country: _____ Province/State/District: _____
   City/Town/Village: _____ Ward/Kgotla: _____
3. **DOB**: / / (DD/MM/YYYY)
4. **Contact No**:_____ Next of Kin/Name:_____ Relationship:_____ Contact No: _____
5. **National Identification** (check all that apply):
   National ID (OMANG): _____ Birth Certificate Number: _____
   Driver Licence: _____ Passport Number: _____ Not Available ☐
6. **HIV Care/ART File Number:** _____ Not Available ☐
7. **Index Case Number**: _____ Not Available ☐
8. **CBS Unique Identifier:** _____
9. **Today's Date:** / / (DD/MM/YYYY)

SECTION B: Care and Treatment Facility Information

1. **District:** _____
2. **Village/Town:** _____
3. **Care & Treatment Facility Name/Code:**
   _____

SECTION C: Report Reception/Data Management Information

4. **District:** _____
5. **Reporting Facility/Code:** _____
6. **Date CRF Completed:** / /
   Completed by: _____
   Contact no: _____
7. **Date CRF Received:** / /
   Received by: _____
   Contact no: _____
8. **Date CRF Entered:** / /
   Entered by: _____
   Contact no: _____

Section D: Client Current Demographic Information

1. **Current Location**
   District Name: _____
   Village/Town: _____
   Ward/Kgotla: _____
   Plot No: _____

5. **Marital Status:** Single ☐ Married ☐ Divorced/Separated ☐ Widow/Widower ☐ Minor ☐ Co-Habiting ☐
6. **Married:** Monogamous ☐ Polygamous ☐

Section E: Client Testing and Treatment History

1. **Date of HIV Diagnosis:** / / **Testing site name/code:** _____
2. **Date first enrolled in care/treatment:** / / **Care/Treatment clinic name/code:** _____

1. **Transferred In:**
   No ☐, skip to Section F
   Unknown ☐, skip to Section F
   Yes ☐, → Question 2

2. **Transfer in Date:** / /
3. **Previous Facility name/code:** _____
4. **Patient was on ART:** No ☐ Unknown ☐
   Yes ☐, HIV Care/Treatment ID number _____
5. **Date of ART initiation in previous facility:** / / Unknown ☐
6. **Regimen** _____ Unknown ☐

Section F: Antiretroviral Treatment (ART) during the reporting period

1. **Current HIV Care/Treatment ID number:** _____ (Note: a patient could receive more than one regimen)

2. **On** 1st line: ☐ Date started on 1st line / / Regimen: _____
   2nd line: ☐ Date started on 2nd line / / Regimen: _____
   3rd line: ☐ Date started on 3rd line / / Regimen: _____
3. **Reasons to switch a new ART regimen:**
   Treatment failure (Viral load not suppressed or drug resistance) ☐ Adverse drug reaction ☐ Gastrointestinal ☐
   Skin ☐ CNS ☐ Haematological ☐ Hepatic dysfunction ☐ Metabolic ☐ Headache ☐
   Kidney dysfunction ☐ Bone dysfunction ☐ Fatigue ☐ Treatment guideline change ☐
   ARV shortage/stockout ☐ Drug-drug interactions ☐ Pregnancy/planning to become pregnant ☐
   Other ☐, Specify: _____

Section G: Women and Child Health during the reporting period (for female patient only)

1. Is the client pregnant?
   - Yes ☐ →
   - No ☐, skip to 2
   - Don't know ☐, skip to 2

a. Last day of menstrual period / / Don't know ☐
b. Due date / / Don't know ☐
c. Attend antenatal care? No ☐ Don't know ☐
   Yes ☐ → Date of 1st ANC visit: / / Gestation (weeks): ____

2. Did the client give birth in the past 24 months?
   - Yes ☐, →
   - No:
     Miscarriage ☐, skip to H
     Stillbirth ☐, skip to H
     Abortion ☐, skip to H
     Don't know ☐, skip to H

The child's date of birth: / / Don't know ☐
Gestation at delivery: ___ weeks **Birth weight:** ___ kg
Birth defects (ICD-10): Yes ☐ No ☐ Don't know ☐
If yes, Specify_____
Was the baby diagnosed with HIV?
- No ☐ Don't know ☐
- Yes ☐ → Date of the diagnosis / / Not Available ☐
  Was the child initiated on ART? No ☐ Yes ☐
  ART File number? _____ _ Not Available ☐

Section H: Laboratory Test Information

CD4 T cell count and percentage during the reporting period

Date of sample collection: / / CD4 count _____ cells/µL CD4 percentage _____%

HIV viral load RNA test during the reporting period

Date of sample collection: / / Detectable copies _____ copies/mL

HIV Drug Resistance during the reporting period

Date of sample collection: / / Date of sample tested: / / Sample rejected ☐ Not done ☐
Major mutation results: NRTI ☐ NNRTI ☐ PI ☐ INI ☐ Other ARV class ☐, specify ART name_____

Section I: Clinical Information During the Reporting Period

Was Tuberculosis diagnosed?
No ☐ Not done ☐
Yes ☐ date / /
Symptom screening positive ☐
Sputum positive ☐
Xray positive ☐
Other positive ☐,
specify _____

Was the patient on TB treatment?
Yes ☐ Start date: / /
Regimen: _____
No ☐ Why? _____

Was TB preventive treatment (TPT) completed?
No ☐ Why? Non-adherence ☐
Developed active TB ☐
No drug supply ☐
Adverse drug reaction ☐,
specify _____
(e.g., rash, neuropathy, liver toxicity)
Yes ☐ Start date: / /
Refill date: / /
End date: / /
Regimen: _____
(e.g., INH, 3HP)

Was the patient LTFU?
No ☐
Yes ☐ date / /

Was the patient transferred out?
No ☐
Yes ☐ date / /

Did the patient die?
No ☐
Yes ☐ date / /
Cause of death:
_____

Clinical Review
Last review date: / / Last refill date: / /
Current review date: / / Current refill date: / /

Was cryptococcal infection diagnosed?
No ☐ Not done ☐ Yes ☐ Date / /
Results: CrAg positive ☐ CM/disseminated ☐
Was the patient on treatment? No ☐ Why? _____
Yes ☐ Start Date: / / Regimen: _____

Was the WHO clinical stage assessed?
No ☐ Yes ☐ → Date: / /
Result: Stage I ☐ Stage II ☐
Stage III ☐ Stage IV ☐

Were any other opportunistic infections diagnosed? No ☐ Yes ☐ Date / /

Appendix 4A: Completing Case Report Form from Newly Diagnosed PLHIV Infections

SECTION A: CLIENT IDENTIFIER
The variables in this section are all required for case-based surveillance (CBS) and must all be completed. If the client has a government issued identification document, please use that to correctly capture the spelling of the clients' name.

1. NAME: This variable includes the Surname, First Name and Middle Name. At a minimum, you must capture the client's surname (usually a family name and sometimes referred to as the last name) **AND** their first name. If the middle name is available, please capture this too.

2. PLACE OF BIRTH: The country where the client was born, the district of birth and the town or city or ward where client was born.

3. DOB (Date of Birth): This must be completed in the DD/MM/YYYY format, starting with two digits for the day, two digits for the month and four digits for the year. *E.g., if the client was born 2nd March 1980, then the person completing the form should enter 02/03/1980.*

4. CONTACT DETAILS: This is the telephone number of a close relative who can be contacted on the occasion that the facility cannot reach the client. The next of kin is usually a spouse, a sibling or some other relative. Confidentiality must always be maintained, and client information must not be disclosed without prior consent from the client.

5. NATIONAL IDENTIFICATION: This should be taken directly from an original government issued document and not word of mouth, the Omang is a national unique identification number provided to all citizens of Botswana. This is the gold standard for identification and should be captured if the client is a citizen of Botswana. If the client is a non-citizen, please capture the passport number as written. Some passports are alphanumeric and contain both letters and numbers, please capture this correctly. Other identification documents can be used if client has them available and as additional identification.

6. HIV CARE/ART FILE NUMBER: This is the number assigned to the client physical file where all their forms are kept at the facility when they are enrolled on ART. Usually written on the outside of the client's file instead of their names.

7. INDEX CASE NUMBER: This is the number assigned to the client if they are offered partner notification services. Not all clients will have an index case number.

8. CBS UNIQUE IDENTIFIER: This is a system auto generated number used to uniquely identify clients on CBS. It will be the main identify on the de-identified CBS dataset.

9. TODAY'S DATE: Today's calendar date, this is to be completed using the format -DD/MM/YYYY

SECTION B: CLIENT DEMOGRAPHIC INFORMATION
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
1. MARITAL STATUS: What is the current marriage status of the client. **2. MARRIED:** If the client has stated that they are married, are they in a polygamous or monogamous marriage? (One husband, one wife or one husband with multiple wives) **Note:** Cohabiting, If the client is living with a partner but not consider themselves married to the partner. **DISTRICT:** This is the current district where the client reside. **VILLAGE/TOWN:** This is the current village or town where the client reside. **WARD/KGOTLA:** This is the current ward or kgotla where the client reside. **PLOT:** This is the current plot number where the client reside. **3. AGE:** Current age of the client, this is not a date but a number. **4. SEX AT BIRTH:** The gender of the client at their birth.
SECTION C: FACILITY INFORMATION
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
1. DISTRICT: This is the district in which the facility is located. **2. TESTING SITE NAME/CODE:** This is the name of the testing site or the code used for the testing site **3. REPORTING SITE/CODE:** This is the name of site where the results are being reported from. **4. POINT OF HIV TESTING SERVICE:** Point of service where the case was diagnosed.
SECTION D: INDEX TESTING
The variables in this section are all required for case-based surveillance (CBS) and must all be completed. **If the client is less than five years of age and is identified through PMTCT, use HTS and ART ID number of the biological mother.**
1. CONTACT OF INDEX CASE: This is a client (contact) who has tested HIV positive, this client (contact) has been referred for testing by an index case. An index case is a client who previously tested positive for HIV, has a relationship with the contact, provided details about the contact for the purposes of HIV testing. I**NDEX CASE ID NUMBER:** This is the number assigned to the index client by the testing facility and is used to link the index cases with their contacts for public health purposes only.

INDEX CASE ART ID NUMBER: This is the number assigned to the client physical file where all their forms are kept at the facility when they are enrolled on ART. Usually written on the outside of the client's file instead of their names.

SECTION E: HIV TESTING

The variables in this section are all required for case-based surveillance (CBS) and must all be completed.

1. DATE OF FIRST HIV POSITIVE TEST: This is the date the client was diagnosed. The date MUST be completed and the DD/MM/YYYY format.

2. TYPE OF HIV TEST: Type of test used for HIV diagnosis

3. HIV TEST RESULT: The documented result.

4. DATE OF HIV POSITIVE VERIFICATION TEST: This is the date the client was diagnosed and then verified to confirm HIV diagnosis. This date MUST be completed and DD/MM/YYYY format used.

SECTION F: CLIENT CLINICAL HISTORY INFORMATION

The variables in this section are all required for case-based surveillance (CBS) and must all be completed. If client is older the five years of age, move to section H.

1. BIRTH WEIGHT: The weight of the baby at birth measured in kilograms.
GESTATION AT BIRTH – This is the amount of development time of the baby before delivery and is measured in weeks

2. MATERNAL ART: Select one of the three options (Yes, No, Don't Know) depending on the mother's ART status. If mother is on ART, then select the correct option and list ALL ART regimen.

3. INFANT ARV PROPHYLAXIS: Select one of the three options (Yes, No, Don't Know) if the infant is on ARV prophylaxis to prevent mother to child transmission. If yes, select or list the medication in use and how long (in weeks) it has been used.

4. BIRTH DEFECTS (ICD-10): Select one of the three options (Yes, No, Don't Know) if medical records indicate the baby has birth defects. If yes, please indicate as documented in the records.

SECTION G: CLIENT CLINICAL HISTORY INFORMATON (Client age > 5 years)

The variables in this section are all required for case-based surveillance (CBS) and must all be completed. Client must be older than 5 years.

1. DATE OF MOST RECENT HIV NEGATIVE TEST: This can be a date (DD/MM/YYYY) if available or provided in number of months prior to positive HIV diagnosis. If client has never been tested, please select this option or if client does not know, select Don't Know.

2. EVER BEEN ON PrEP: Pre-exposure prophylaxis (PrEP) is a pill taken by those at risk of getting HIV. Select one of the four options (Yes, No, Refuse or Unknown).

3. EVER BEEN ON ART: Please select one of the four options (Yes, No, Refuse or Unknown).

4. EVER DONE A CD4 TEST: Please select one of the four options (Yes, No, Refuse or Unknown).

5. EVER DONE A VIRAL LOAD TEST: Please select one of the four options (Yes, No, Refuse or Unknown).

6. EVER RECEIVED ARV/ART PROPHYLAXIS TO PREVENT MOTHER TO CHILD HIV TRANSMISSION: Please select one of the four options (Yes, No, Refuse or Unknown).

7. IS THE CLIENT FEMALE > 12 YEARS OF AGE: Select appropriate response

8. IF CLIENT IS FEMALE >12 YEARS OF AGE: Select all that apply

SECTION H: CLIENT CLINICAL INFORMATION – AT TIME OF DIAGNOSIS

The variables in this section are all required for case-based surveillance (CBS) and must all be completed.

1. WHO CLINICAL STAGE ASSESSED: If No, go to question 2. If an assessment was conducted, select Yes and select the result of the assessment (Stage I, II, III, IV).

2. 1st CD4 TEST CONDUCTED? If a CD4 test was conducted, select Yes and enter the sample collection date, sample test date using the date format (DD/MM/YYYY), result count and result percent.

3. ART INITIATED? If client is not initiated on ART, please document if they were referred or they refused. If client is initiated on ART, select Yes; Date of Initiation and Regimen.

4. CRYPTOCCOCAL INFECTION DIAGNOSED? Select one of three options (No, Not Done or Yes), if Yes, document date (DD/MM/YYYY) and results.

5. TUBERCULOSIS (TB) DIAGNOSED? If TB not diagnosed, select No and complete the follow up questions. If TB preventive therapy (TPT) given, select Yes, date (DD/MM/YYYY) and regimen of therapy. If TPT not given, select No and reason by selecting one of the four options provide (client refused, contraindication, already completed TPT, no drug supply).
If TB diagnosed, select Yes, and complete the follow up questions. If patient was on TB treatment select Yes, start date for treatment and regimen. If patient is not on treatment, select No and document reason. Select Not Done if TB test not conducted.

6. ANY OTHER OPPORTUNISTIC INFECTIONS (OI) DIAGNOSED? In none, select No. If other OIs are diagnosed, select Yes, the date of diagnosis and specify the opportunistic infection.

SECTION I: CASE REPORT FORM/DATA MANAGEMENT INFORMATION

The variables in this section are all required for case-based surveillance (CBS) and must all be completed.

1. DATE CRF COMPLETED: This is the date when the CRF is fully completed and should adhere to the following format- (DD/MM/YYYY). *E.g., if the CRF is completed on 20th June 2005, then the date CRF completed is 20/06/2005.*

COMPLETED BY: This is the full name (first name and last name) of the person completing the CRF.

CONTACT NUMBER: This is the telephone contact number of the person completing the CRF.

2. DATE CRF RECEIVED: This is the date the CRF is received at the designated clinic or district level for entry into the DHIS-2. The (DD/MM/YYYY) format must be used. *E.g., if the CRF is received on 25th June 2005, then the date CRF received is 25/06/2005.*

RECEIVED BY: This is the full name (first name and last name) of the person receiving the CRF at the designated clinic or district level facility.

CONTACT NUMBER: This is the telephone contact number of the person receiving the CRF at the designated clinic or district level facility.

3. DATE DATA ENTERED: This is the date the data from the CRF is entered into the DHIS-2 at the designated clinic or district level facility. The (DD/MM/YYYY) format must be used. *E.g., if the CRF is entered on 27th June 2005, then the date CRF entered is 27/06/2005.*

ENTERED BY: This is the full name (first name and last name) of the person entering data from the CRF into the DHIS-2

CONTACT NUMBER: This is the contact number of the person entering the data from the CRF into the EMR.

Appendix 4B: Completing Case Report Form for Sentinel Events

SECTION A: CLIENT IDENTIFIER
The variables in this section are all required for case-based surveillance (CBS) and must all be completed. If the client has a government issued identification document, please use that to correctly capture the spelling of the clients' name.
1. NAME: This variable includes the Surname, First Name and Middle Name. At a minimum, you must capture the client's surname (usually a family name and sometimes referred to as the last name) **AND** their first name. If the middle name is available, please capture this too. **2. PLACE OF BIRTH:** The country where the client was born, the district of birth and the town or city or ward where client was born. **3. DOB (Date of Birth):** This must be completed in the DD/MM/YYYY format, starting with two digits for the day, two digits for the month and four digits for the year. *E.g., if the client was born 2nd March 1980, then the person completing the form should enter 02/03/1980.* **4. CONTACT DETAILS**: This is the telephone number of the client and the contact number of a close relative who can be contacted on the occasion that the facility cannot reach the client. The next of kin is usually a spouse, a sibling, or some other relative. *Confidentiality must always be maintained, and client information must not be disclosed without prior consent from the client.* **5. NATIONAL IDENTIFICATION:** This should be taken directly from an original government issued document and not word of mouth, the Omang is a national unique identification number provided to all citizens of Botswana. This is the gold standard for identification and should be captured if the client is a citizen of Botswana. If the client is a non-citizen, please capture the passport number as written. Some passports are alphanumeric and contain both letters and numbers, please capture this correctly. Other identification documents can be used if client has them available and as additional identification. **6. HIV CARE/ART FILE NUMBER:** This is the number assigned to the client physical file where all their forms are kept at the facility when they are enrolled on ART. Usually written on the outside of the client's file instead of their names**.** **7. INDEX CASE NUMBER:** This is the number assigned to the client if they are offered partner notification services. Not all clients will have an index case number. **8. CBS UNIQUE IDENTIFIER:** This is a system auto generated number used to uniquely identify clients on CBS. It will be the main identify on the de-identified CBS dataset. **9. TODAY'S DATE:** Today's calendar date, this is to be completed using the format -DD/MM/YYYY

SECTION B: CARE AND TREATMENT FACILITY
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
1. DISTRICT: This is the district in which the facility is located **2. VILLAGE/CITY:** This is the name of the village or city of the facility where the client is receiving their HIV care and treatment **3. CARE AND TREATMENT FACILTY NAME/CODE:** This is the name of the facility where the client is receiving their HIV care and treatment.
SECTION C: CLIENT CURRENT DEMOGRAPHIC INFORMATION
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
1. LOCATION AND TYPE OF RESIDENT: This is the current residential location of the client. Please complete all the location information down to the plot number if it is available. **2. MARITAL STATUS:** Please select one of the four options (Single, Married, Divorced/Separated, Widow/Widower) depending on the client's self-reported status. **3. MARRIED:** If the client has stated that they are married, are they in a polygamous or monogamous marriage.
SECTION D: CLIENT TESTING AND TREATMENT HISTORY
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
1. DATE OF HIV DIAGNOSIS: This is the date the client first tested positive was diagnosed with HIV. The date MUST be completed using the DD/MM/YYYY format. **TESTING SITE NAME/CODE:** This is the name/code of the HIV testing site where the client was first diagnosed with HIV. **2. DATE FIRST ENROLLED IN CARE/TREATMENT:** This is the date the client was initiated into HIV care and treatment. This date MUST be completed using the DD/MM/YYYY format. **CARE/TREATMENT CLINIC NAME/CODE**: This is the name/code of the facility where the client was first initiated into care/treatment after being diagnosed with HIV. **3. TRANSFERRED IN:** Is the client transferring in from another facility, if No or Unknown then skip to section F. If Yes, go to question 4. **4. TRANSFER DATE:** What date is the date of transfer, usually this would be the current calendar date and be completed using the DD/MM/YYYY format.

5. PREVIOUS FACILITY NAME: Name of the client's previous facility. If the client has been to more than one facility, this should the most recent facility where the client received care.

6.PATIENT WAS ON ART: Please select one of three response options (No, Unknown or Yes). If the response is Yes, document HIV Care/Treatment ID number.

7. DATE OF ART INITIATION IN PREVIOUS FACILITY: This is the date the client was initiated into treatment at the facility they transferred in from.

8. REGIMEN: Document the regimen the client was on at the previous facility.

SECTION E: ANTIRETOVIRAL TREATMENT (ART) DURING THE REPORTING PERIOD

The variables in this section are all required for case-based surveillance (CBS) and must all be completed. If client is older the five years of age, move to section H.

1. CURRENT HIV CARE/TREATMENT ID NUMBER:
ON: Select which line of treatment the client in currently receiving, the date they started using the format (DD/MM/YYYY) and the regimen.

2. REASONS TO SWITCH TO A NEW ART REGIMEN: If the client switched from one regimen to another, document the reason (s) why the switch was made.

SECTION F: WOMEN AND CHILD HEALTH DURING REPORTING PERIOD (Female Clients Only)

The variables in this section are all required for case-based surveillance (CBS) and must all be completed.

1. IS THE CLIENT PREGNANT: If No or Unknown, skip to Question 2. If Yes, tick the correct box and complete the rest of this section.

a. LAST DAY OF MENSTRUAL PERIOD: If the client's last day of their menstrual cycle is known, complete as much of the date information. It is possible they may remember just the month and year. If they know the full date, use the format (DD/MM/YYYY). If only the month and the year is known then use the format (99/MM/YYYY) where 99 is unknown date. If they do not know the date, select Don't Know.

b. DUE DATE: If the client's due date is known, document the date using the format (DD/MM/YYYY). If it is not known, select Don't Know.

c. ATTEND ANTENATAL CARE: Depending on weather the client has attended antenatal clinic, select one of three options (No, Don't Know, Yes). If Yes, document the date of their first visit for antenatal care using the format (DD/MM/YYYY) and gestation in weeks.

2. DID THE CLIENT GIVE BIRTH IN THE PAST 24 MONTHS: Probe and assess if client delivered a child in the past 24 months. If Yes, complete the next section. If the answer is No, tick one of the four options (Miscarriage, Stillbirth, Abortion or Don't Know).

SECTION G: LABORATORY TEST INFORMATION
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
CD4 T CELL COUNT AND PERCENTAGE DURING THE REPORTING PERIOD
DATE OF SAMPLE COLLECTION: This is the day that a sample of the client's blood is drawn for testing. Please use the format (DD/MM/YYYY).
CD4 COUNT: This is the result of a CD4 count test and is displayed as a whole number.
CD4 PERCENTAGE: This is also the result of a CD4 count test and is displayed as a percentage (%)
HIV VIRAL LOAD RNA TEST DURING THE REPORTING PERIOD
DATE OF SAMPLE COLLECTION: This is the day that a sample of the client's blood is drawn for testing. Please use the format (DD/MM/YYYY).
DETECTABLE COPIES: This is the result of the viral load test and is displayed in whole numbers.
HIV DRUG RESISTANCE DURING THE REPORTING PERIOD
DATE OF SAMPLE COLLECTION: This is the day that a sample of the client's blood is drawn for testing. Please use the format (DD/MM/YYYY).
DATE SAMPLE TESTED: This is the day that the sample of the client's blood is tested. Please use the format (DD/MM/YYYY).
SAMPLE REJECTED: Tick this box is a sample was collected and submitted for testing and the laboratory rejects it.
NOT DONE: Tick this box if a sample was not collected for drug resistance testing.
MAJOR MUTATION RESULTS: If a sample is collected ,tested and the results returned; please select one of the options listed and specify if other.
SECTION H: CLINICAL INFORMATION DURING REPORTING PERIOD
The variables in this section are all required for case-based surveillance (CBS) and must all be completed.
TUBERCULOSIS (TB) DIAGNOSED? If TB not diagnosed, select No and complete the follow up questions. If TB preventive therapy (TPT) given, select Yes, date (DD/MM/YYYY) and regimen of therapy. If TPT not given, select No and reason by selecting one of the four options provide (client refused, contraindication, already completed TPT, no drug supply). If TB diagnosed, select Yes, and complete the follow up questions. If patient was on TB treatment select Yes, start date for treatment and regimen. If patient is not on treatment, select No and document reason. Select Not Done if TB test not conducted. **WHO CLINICAL STAGE ASSESSED:** If No, go to question 2. If an assessment was conducted, select Yes, and select the result of the assessment (Stage I, II, III, IV). **1st CD4 TEST CONDUCTED?** If a CD4 test was conducted, select Yes, and enter the sample collection date, sample test date using the date format (DD/MM/YYYY), result count and result percent. **ART INITIATED?** If client is not initiated on ART, please document if they were referred or they refused. If client is initiated on ART, select Yes, Date of Initiation and Regimen.

CRYPTOCCOCAL INFECTION DIAGNOSED? Select one of three options (No, Not Done or Yes), if Yes, document date (DD/MM/YYYY) and results.

ANY OTHER OPPORTUNISTIC INFECTIONS (OI) DIAGNOSED? In none, select No. If other OIs are diagnosed, select Yes, the date of diagnosis and specify the opportunistic infection.

SECTION I: CASE REPORT FORM/DATA MANAGEMENT INFORMATION

The variables in this section are all required for case-based surveillance (CBS) and must all be completed.

1. DISTRICT: This is the district in which the facility is located

2. REPORTING FACILITY/CODE: This is the name of the testing site or the code used for the testing site

3. DATE CRF COMPLETED: This is the date when the CRF is fully completed and should adhere to the following format- (DD/MM/YYYY). *E.g., if the CRF is completed on 20th June 2005, then the date CRF completed is 20/06/2005.*

COMPLETED BY: This is the full name (first name and last name) of the person completing the CRF.

CONTACT NUMBER: This is the telephone contact number of the person completing the CRF.

4. DATE CRF RECEIVED: This is the date the CRF is received at the designated clinic or district level for entry into the DHIS-2. The (DD/MM/YYYY) format must be used. *E.g., if the CRF is received on 25th June 2005, then the date CRF received is 25/06/2005.*

RECEIVED BY: This is the full name (first name and last name) of the person receiving the CRF at the designated clinic or district level facility.

CONTACT DETAILS: This is the telephone contact number of the person receiving the CRF at the designated clinic or district level facility.

5. DATE DATA ENTERED: This is the date the data from the CRF is entered into the DHIS-2 at the designated clinic or district level facility. The (DD/MM/YYYY) format must be used. *E.g., if the CRF is entered on 27th June 2005, then the date CRF entered is 27/06/2005.*

ENTERED BY: This is the full name (first name and last name) of the person entering data from the CRF into the DHIS-2

CONTACT DETAILS: This is the contact number of the person entering the data from the CRF into the EMR.

Appendix 5: Chain of Custody Form

Date of Transfer	Name of person handing over documents	Designation	District	Location of hand over	No. of forms handed over	Name of forms (codify)	Signature	Name of Document/Form Recipient	Designation	District	Confirm No. of forms handed over	Date of Receipt	Signature of recipient