

FINAL REPORT

VALIDATION AND ANALYSIS OF HIV TESTING DATA IN THE COMMUNITY SETTING

“COBATEST NETWORK”

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VALIDATION AND ANALYSIS OF HIV TESTING DATA IN THE COMMUNITY SETTING

Centre d'estudis epidemiològics sobre les ITS i SIDA de Catalunya (CEEISCAT), Catalonia, Spain and

COBATEST network

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1. Abbreviations

HIV	Human Immunodeficiency Virus
HTS	HIV testing services
CBVCT	Community-based voluntary counselling and testing service
ECDC	European Centre for Disease Prevention and Control
EU/EEA	European Economic Area
EU	European Union
FSW	Female sex worker
MSM	Men who have sex with men
MSW	Male sex worker
M&E	Monitoring and evaluation
NGOs	Non-governmental organizations
PWID	People who inject drugs
SD	Standard deviation
STI	Sexually transmitted infection(s)
SW	Sex workers
VCT	Voluntary counseling and testing

2. Key terms

Data quality: Refers to the condition of a set of values of qualitative or quantitative variables. There are many definitions of data quality but data is generally considered high quality if it is fit for its intended uses in operations, decision making and planning.

Data quality assurance: It is the process of data profiling to discover inconsistencies and other anomalies in the data, as well as performing data cleaning activities.

Data quality control: It is the process of assessing the quality of data. This process is usually done after a Data Quality Assurance process, which consists of discovery of data inconsistency and correction.

Community-based voluntary counseling and testing: CBVCT is any programme or service that offers HIV counselling and testing on a voluntary basis outside formal health facilities and that has been designed to target specific groups of the population most at risk and is clearly adapted for and accessible to those communities [1]. Moreover, these services should ensure the active participation of the community with the involvement of community representatives either in planning or implementing HIV testing interventions and strategies.

Completeness: The proportion of stored data against the potential of "100% complete"

Consistency: Internal consistency between variables. The absence of difference, when comparing two or more representations of a thing against a definition.

Transcription validity: The percentage of data that conforms to the syntax (format, type, range) of its definition.

3. Executive summary

The COBATEST network is a network of CBVCT services, established in the framework of the European project HIV community-based testing practices in Europe (HIV-COBATEST) [1]. This network has developed standard data collection instruments and procedures to homogenize the Monitoring and Evaluation (M&E) of HIV testing activities at community level. Despite the lack of representativeness of the COBATEST network across Europe, we believe that the network serves as a sentinel source of HIV testing information, and it is considered relevant and of added value as it provides a unique EU-level perspective.

The data collected through the community-based voluntary counselling and testing (CBVCT) services has proven to be strategic in increasing the evidence on the need for strengthening community-based service delivery models as an integral part of the HIV strategic investments. Furthermore, data collected from CBVCT services can be used as an important source of information contributing to supporting quality services along the HIV care cascade. Measuring the success and improving the management of CBVCT services is predicated on data management and data collection processes that are related to program implementation and organization.

The aim of this study is to provide a common approach for assessing and improving overall data quality collected by the CBVCT services participating in the COBATEST network. The specific objectives of this study are: to perform a data quality assessment of the data collected by the COBATEST network based on the functional areas of a data management and reporting system and on the three dimensions of data quality (transcription validity, completeness, consistency) from 2015 to 2016, and to produce a report inclusive of recommendations on how to improve the quality of such data in view of their possible integration with the national surveillance data.

The analysis included data collected through three possible sources: the COBATEST web-based entry data system that uses a standardized questionnaire; disaggregated data submitted by members of the COBATEST network that use their own data entry system; and aggregated data (indicators) sent by the rest of the CBVCT services. The assessment of the functional components of CBVCT services data management was performed using a questionnaire. The questionnaire was sent by email to all the CBVCT service coordinators in the COBATEST network and covered six functional areas of a data management and reporting system: M&E capabilities, roles and responsibilities; Indicator definitions and reporting guidelines; Data collection and reporting tools and forms; Data management processes; Links with the national reporting system and Data use. Data quality was measured using three dimensions: transcription validity, completeness and consistency. The site audits were conducted in eight sites selected according to geographical location and format of data submission to COBATEST (using the web-based entry data tool, aggregated or disaggregated). The site audits were structured in three phases: Narrative open description of the data collection process followed by each CBVCT service; Audit questionnaire; Documentation review, including availability of documents.

Thirty-four out of CBVCT services responded to the “Assessment of the Functional Components of CBVCT Services Data Management” survey, a response rate of 87%. Twenty-four of 34 respondents (71%) reported sending data to the COBATEST network through the web-based entry data tool, two (6%) in a disaggregated manner and five (14%) in an aggregated manner (COBATEST indicators). Three CBVCT services (9%) reported not being able to send data. Overall, most of the CBVCT services participating in the COBATEST network are NGOs (82.4%), funded by a public/governmental organization or co-funded by public and/or private entities (88.3%), which differ in size and in the type of settings where their activities are implemented.

When the M&E capabilities, roles and responsibilities were assessed overall, it was found that around half (53%) of CBVCT centres have a documented organizational structure that identifies roles for data management, more than half (61.8%) of the centres have training plans on data management both for the staff and volunteers, 56% of the centres have someone responsible for reviewing the quality of data but just 41.2% have designated staff responsible for reviewing the quality of aggregated numbers or the digitalization of data prior to the submission to the COBATEST network. The identification of M&E and data management staff depended broadly on the size of the organisation. It was observed that CBVCTs that send disaggregated data have nobody designated to review the data quality and oversee the submission of data to the COBATEST Network. All organisations ensure that voluntary counselling and testing (VCT) staff are trained in how to use the questionnaire in a consultation. In larger organisations there is a separation between counselling and testing services and data management activities, which is reflected in the training. The staff in organisations with links to academic institutions or government bodies are more likely to receive data management training. The smaller organisations have less formal training processes in place but benefit from high staff retention, reducing the need to train new staff regularly.

The functional area of indicator definitions and guidelines had 76.5% of all CBVCT services participating in the network are using data collection guidelines, but just 52.9% are using the COBATEST network guidelines. A higher proportion (66.7%) of services using the web-based data entry tool are using the COBATEST indicator guidelines than those sending aggregated data. Services sending disaggregated data do not use the COBATEST guidelines at all. Each centre uses a standardised data collection form but the way of implementing it is different within and across centres. Some sites ask counsellors to complete the form with the client present, while others have an open discussion with the client and then complete the form. Most sites use paper questionnaires.

The data management process is the functional area with greatest weaknesses as just three services from the whole COBATEST network had a written procedure to address any quality error, only 35.3% (n=12) of the surveyed services performed quality control and 29.4% (n=10) have an established procedure to resolve any discrepancies or inconsistencies found in the datasets. Regarding the process to ensure proper follow-up of people that have been linked to care was assessed, it was found that just 10 CBVCT services out of those surveyed have a procedure in place, most (9) of those belonged to the group of the centres submitting data using the COBATEST data entry tool. From the CBVCT services that responded to the survey,

just 16 centres (47.1%) are reporting data to the national information system or national authority. It is important to bear in mind that 11 of these centres belong to the “DEVO Network”, which is a network of CBVCTs created in Catalonia-Spain with the help of the Regional Surveillance System, and this might introduce a bias in the result of this question. By and large, the National Reporting Systems, if they exist, collect much more basic data than those collected by the CBVCTs as the requirements from National Reporting Systems were minimal.

Of all CBVCT services surveyed, 61.8% (n=21) reported that the service performs analyses on the collected data in an independent manner from the COBATEST network for internal purposes, 41.2% (n=14) use the information generated by the COBATEST network, and 11.8% (4) make decisions based on the collected data. The percentages related to use of information and decision-making based on the collected data are higher among the services, which are using the data entry tool, 54.2% and 58.2% respectively.

Three services reported using their own data collection tool alongside COBATEST's. Four sites responded that they did not use the COBATEST web-based entry data tool, as they needed data, which was not included in the questionnaire, and one reports that they had to use the national information system's data collection form. Twenty-eight sites report using the COBATEST web-based entry data tool for data extraction, using either the indicators report from the COBATEST tool (16) or the automatically generated Excel files (12). This suggests that the data extraction functions of the COBATEST tool are useful for most sites. The extracted data is most commonly used to follow the CBVCT's daily activities (17) indicating the databases of most of the sites are kept up-to-date and consulted frequently.

Regarding the assessment of the data quality by dimensions, it was found that in general across the whole network; transcription, completeness and consistency are kept in a high quality, however when compared between the different submission formats, the highest score was found among the CBVCT services that use the web-based entry data system. It is important to take into account that for disaggregated and aggregated data submission formats, this analysis of data quality was performed after data was collected, processed and formatted to follow COBATEST guidelines, so it may underestimate the transcription and completeness errors.

This assessment has identified a number of weaknesses in the data quality of the COBATEST network; such as low identification and designation of M&E capabilities, roles and responsibilities among the CBVCT services' staff; limited utilisation of the COBATEST guidelines; lack of identification of clear written procedure to address any quality error and procedures to resolve any discrepancies or inconsistencies found in the datasets; and without taking into account those CBVCTs participating in the DEVO Network, there are no clear procedures for sharing data collected at CBVCT service level with the national/regional surveillance systems.

In conclusion, the findings from this evaluation indicate that CBVCT services have reliable data to support quality planning and management of the services. However, data need to improve

quality procedures in order to produce quality data to translate into evidence to support further expansion of CBVCT service in the EU/EEA, including by paving the way for CBVCT-generated data to be integrated into national surveillance systems.

Based on the evaluation findings, a set of key recommendations have been highlighted:

- The development of a CBVCT/COBATEST Standard Operating Procedure (SOP) could be a relatively low-resource first step in clarifying staffing needs and processes for the generation and use of strategic information as well as for the set-up of standardized quality assurance processes among the COBATEST participating CBVTC services. This may include modifying and merging already existing site-specific documents as a single source of information containing indicator definitions, guidelines covering collating/aggregating, auditing procedures, as well as other steps of data collection, handling, analysis, and reporting.
- In the context of the COBATEST network it would be advisable that all CBVCT services use the web-based entry data tool as this will reduce error, data collection burden and it would also allow for real-time access to data.
- There are two important groups of variables that need to be addressed by the network, one is the personal identifier and the other is the risk group, as currently there are no standard definitions to be followed and that could be adapted to CBVCT services context.
- This data quality assessment has served to identify shortcomings of the existing web-platform that need to be addressed to improve its utility and usage.
- COBATEST network should work on provide operational support, coordination and IT support at the stage of data collection and analysis.
- M&E activities should be centralized by the network, and they should include training, mentoring initiatives and fostering data use (including dissemination) for evidence-based decision-making.
- Streamlining indicators and selection of a core set of variables that could be used to monitor HIV testing at European level is needed. Therefore, COBATEST network should create a process of selection of key variables to be collected, serving both the purposes of supporting service monitoring and contributing to European-level monitoring, while reducing the data collection and management burden for the CBVCT sites. This process should be in line with European level initiatives, such as the Joint Action INTEGRATE or the Dublin Declaration monitoring process.

4. Introduction

A number of different modalities have been developed in the past decades to deliver HIV testing services (HTS) to most-at-risk populations. Among these approaches, community-based voluntary counselling and testing (CBVCT) services have been recognized as a good model to improve access to key populations by promoting early HIV diagnosis, and play an essential role in improving outcomes in the HIV care continuum, when coupled with effective linkage to care. Given the value and contribution of HIV testing conducted in the CBVCT services towards the reduction of the undiagnosed fraction in the EU/EEA region, in 2009 the COBATEST network of CBVCT services was created with the purpose of sharing similar procedures to monitor the activity of CBVCT services across Europe in order to ultimately promote HIV testing and counselling, early diagnosis and care for hard-to reach groups. This network was created in the context of the HIV-COBATEST project (HIV Community-based testing practices in Europe 2010-2014), and by 2015 was formed by 46 CBVCT services from 20 different European countries (Germany, Denmark, Czech Republic, Poland, France, Slovenia, Belgium, Romania, Portugal, Lithuania, Latvia, UK, Hungary, Ukraine, Austria, Greece, Italy, Croatia, Switzerland and Spain).

One of the main objectives of the network is to monitor HIV testing activities conducted in the participating CBVCT services. To do so, a standardised protocol including a core set of indicators to monitor HIV testing activities has been defined, and a COBATEST web-based entry data system have been created to collect and analyse the data and to make comparisons between CBVCT services possible. For participating CBVCT services that are not able to use the web-based entry data system, a parallel data collecting process was created to submit a minimum set of data or aggregated CBVCT core indicators.

The information collected through the CBVCT services has proven to be strategic in increasing the evidence on the need for strengthening community-based service delivery models as an integral part of the HIV strategic investments, and to be used as an important source of information contributing to supporting quality services along the HIV care cascade. Moreover, this strategic information should also lead to a deeper understanding of the context of the epidemic, by describing the vulnerabilities that certain communities or sub-groups face and the risks these populations are exposed to.

Taking into account the importance of the information generated from the CBVCT services and its potential utility, this data should accurately reflect what is being monitored or evaluated, and additionally should be timely and relevant. High quality data is critical for decision-making processes and for accurately assessing the impact of CBVCT services in order to maximize their effectiveness, responsiveness and cost-effectiveness. With these premises, the COBATEST network is striving to continuously improve the quality of the reported data.

In order to act as a network, a data quality assessment has been performed with the purpose of identifying possible problems and difficulties that CBVCT services face in the data collection process, analysis and use. The perception that data collected by the COBATEST network are reliable, can significantly influence how organizations respond to data, how local, national and European stakeholders perceive and value the strategic information collected by the CBVCT

services, and whether these data could ultimately be integrated into formal surveillance system at national and regional levels.

5. Study Objectives

Measuring the success and improving the management of CBVCT services is predicated on data management and data collection process that are related to program implementation and organization. The aim of this study is to provide a common approach for assessing and improving overall data quality collected by the CBVCT services participating in the COBATEST network. Therefore, the specific objectives of this study are:

1. To perform a data quality assessment of the data collected by the COBATEST network from 2015 to 2016 based on three dimensions of the data quality: transcription validity, completeness, consistency; and two processes: data collection and use of data.
2. To produce a report inclusive of recommendations on how to improve the quality of such data in view of their possible integration with the national surveillance data.

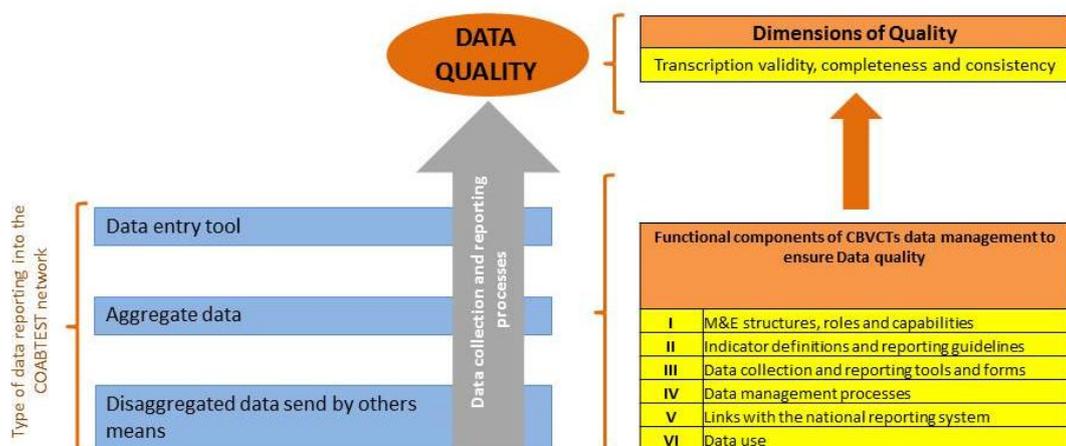
6. Methods

6.1. Conceptual framework

The conceptual framework for the data quality assessment is illustrated in the Figure 1 and is based on the data quality audit tool described by the USAID [2]. The framework took into account that quality of reported data depends on the underlying data management and the type of reporting to the COBATEST network, by the COBATEST web-based entry data system that uses a standardized questionnaire; disaggregated data submitted by members of the COBATEST network that use their own data entry system; and aggregated data (indicators) sent by the rest of the CBVCT services. Therefore, for good quality data to be produced by and flow through a data-management process and type of reporting data, key functional components need to be in place at all levels of the process, namely the points of service delivery and the intermediate level(s) where the data are collected, transformed and/or aggregated. The framework directed the COBATEST data quality assessment to (1) verify the quality of the data by dimensions, (2) assess the process that produces that data, and (3) develop action plans to improve both and to view their possible integration with the national surveillance data.

The dimensions of data quality included are: transcription validity, completeness and consistency. The functional components of CBVCT services management to ensure data quality are: a) M&E structures, roles and capabilities, b) indicator definitions and reporting guidelines, c) data collection and reporting tools and forms d) data management processes, e) links with the national reporting system, and f) data use.

Figure 1. Conceptual Framework for data quality, including the means of reporting, the dimensions of quality and the functional components of CBVCT services data management to ensure data quality.



6.2. Assessment of data quality by dimensions

6.2.1. Quantitative analysis

All the data collected by the COBATEST network between 01/01/2015 to 31/12/2016 were evaluated, independently from the data submission format. Annex 2 shows lists of CBVCT services that were part of the data quality assessment and describes their data submission modes and formats by calendar year.

The analysis included data collected through the COBATEST web-based entry data system that uses a standardized questionnaire (See Annex 1 and Annex 3 describing the variables collected using this method), disaggregated data submitted by members of the COBATEST network that use their own data entry system (See Annex 4 describing the variables collected using this method) and aggregated data (indicators) sent by the rest of the CBVCT services (See Annex 5).

Data quality was measured using three dimensions: transcription validity, completeness, consistency (Annex 6 and 7).

a) Transcription

To measure transcription error, the number of records deemed inaccurate was divided by the number of non-empty records that should be reported according to each variable (given the questionnaire contains filter-type questions). Records are considered inaccurate if data do not conform to the syntax (format, type, range) of its definition. In the case of a date value, it is considered inaccurate if the value does not correspond to a date or, if applicable, the date is not within a reasonable range with respect to the date of visit. For each CBVCT service which submitted data (using either submission format - COBATEST web-based data entry tool or own data entry) per year, and the annual total was calculated for the years 2015 and 2016. In order to compare between CBVCT services and the entire COBATEST dataset, two indices were defined, constructed from the weighted average of the proportion of correct transcriptions calculated for each variable. The first index was constructed from all COBATEST variables and a second index from the basic variables likely to be included in the core set of variables to monitor HIV testing at European level [3]. The weights were defined according to the degree of importance of the variable. Annex 8 describes the variables selected and the weights used in each case. Score thresholds were defined as it follows: <90 (low degree of transcription validity); between 90-95 (medium degree of transcription validity) and >95 (high degree of transcription validity).

b) Completeness

To measure completeness, the number of incomplete records was divided by the number of records that should be reported according to each variable (given the questionnaire uses filter-type questions). Fields are considered incomplete if left blank and considered complete if there is a value reported. For each CBVCT service which submitted data (using either submission format - COBATEST web-based data entry tool or own data entry) per year, and the annual total was calculated for the years 2015 and 2016. In order to

compare between CBVCT services and the entire COBATEST dataset, two indices were defined, constructed from the weighted average of percentage of completeness for each variable. The first index was constructed from all COBATEST variables and a second index from the basic variables likely to be included in the core set of variables to monitor HIV testing at European level [3]. The weights were defined according to the degree of importance of the variable. Annex 8 describes the variables selected and the weights used in each case. Score thresholds were defined as it follows: <90 (low degree of completeness); between 90-95 (medium degree of completeness) and >95 (high degree of completeness).

c) **Consistency**

To measure consistency, variables that are dependent on each other are grouped together and the number of inconsistent records in each group is divided by the total number of records. For each CBVCT service which submitted data (using either submission format - COBATEST based data or own data entry) per year, and the annual total was calculated for the years 2015 and 2016. In order to compare between CBVCT services and the entire COBATEST dataset, an index was defined, constructed from the weighted average of percentage of consistency for each variable. The weights were defined according to the degree of importance of the variable. Annex 9 describes the variables selected and the weights used in each case. Score thresholds were defined as it follows: <90 (low degree of consistency); between 90-95 (medium degree of consistency) and >95 (high degree of consistency).

6.2.2. Qualitative analysis

A qualitative analysis was also performed to assess the process of collecting and analysing data once the data has been sent to the COBATEST network, in order to understand the data within the context of the data quality assessment framework. These processes include an initial, one-time assessment of data and the data environment (metadata, reference data and data submission format); automated control processes once the data are on the COBATEST network server and a periodic reassessment of data and the data environment.

6.3. Assessment of the functional components of CBVCT services data management

This assessment was performed through a questionnaire sent by email to all the CBVCT service coordinators that are partners of the COBATEST network. CBVCT services' manager were invited to complete an anonymous online questionnaire about the functional components of CBVCT services data management hosted by the Survey Monkey website. Invitation emails were sent out on 26 April 2017, and the survey was closed on 03 July 2017. Two email reminders were sent.

1. Questionnaire

The questionnaire (annex 15) is a structured ad hoc instrument and was piloted by four CBVCT services. Each questionnaire was assigned an identification number linked to one CBVCT service.

The questionnaire included questions related to the main administrative and organizational CBVCT services' characteristics and to the six functional areas of a data management and reporting system (figure 1). The questions were designed to highlight threats to data quality and related aspects of the data management and reporting system that may require attention.

The six functional areas of a data management and reporting system assessed were as follows:

1. M&E capabilities, roles and responsibilities
2. Indicator definitions and reporting guidelines
3. Data collection and reporting tools and forms
4. Data management processes
5. Links with the national reporting system.
6. Data use

2. Statistical analysis

Each functional component of the data management was scored from 1 to 3. The scores generated for each functional area on the CBVCT service were an average of the responses which are coded 3 for "Yes, completely," 2 for "Partly," and 1 for "No, not at all." Responses coded "N/A" or "Not Applicable," were not factored into the score. The scores were intended to be compared across functional areas as a means of prioritizing system strengthening activities. That is, the scores were comparable to each other and were most meaningful when comparing the performance of one functional area to another. The descriptive analysis included the generation of a spider-graph displaying qualitative data generated from the assessment of the data management and reporting system. The graph was used to prioritize areas for improvement. Analysis was performed to compare between CBVCT services and for the entire COBATEST dataset. Data analysis was performed using STATA version 12.

6.4. Sites audits

A purposive selection method has been used to select the sites for the audits. Selection criteria included their geographical location and the way they submit data to COBATEST (Using the online tool, aggregated or disaggregated). It is important to note that the information collected from these sites was not used to make inferences or generalizations about the entire COBATEST network, or a group of sites, or a specific region. The number of sites selected for the audits was eight. The site visits were performed during July 2017.

Selected sites were notified prior to the visit for the data quality assessment. This notification was important in order for appropriate staff to be available. An external independent consultant performed all the site audits. The visits required between half to one day.

The site audit was conducted in three phases:

Part A: Narrative open description of the data collection process followed by each CBVCT service. This part described the process of primary data collection and recoding. This phase was recorded on a tape and transcribed after the audit. This phase gave the audit expert a “frame of reference” for the link between the service delivery and recording process, and obtained clues as to whether outside factors such as time, competing activities and/or method of data collection hampered the accurate and timely recording of CBVCT service data.

The open description was also an opportunity to discuss answers to the questionnaire “Assessments of the Functional Aspects of CBVCT Services” previously completed. Prior to the audit, answers that required clarification were identified.

Part B: Audit questionnaire for the CBVCT services selected for the audit site (Annex 16). It is important to note that some questions were omitted if the questions were deemed not relevant to the CBVCT service after the first phase of the audit.

Part C: Documentation Review availability of documents, as per list provided in the check list (Annex 17).

Documentation review depended on the data submission method of the CBVCT service as described below:

a) COBATEST tool

The following documents were reviewed:

1. The templates of the source document (by obtaining a blank copy) and determine if the site has sufficient supplies of blank source documents;
2. Availability and completeness of source documents;
3. The use of the COBATEST unique identifier.

b) Excel (Disaggregated data)

Comparison between centre’s questionnaire and COBATEST questionnaire. The centre explained which question(s) on their questionnaire was used to construct each variable asked by COBATEST.

c) Excel (Aggregated data)

Comparison between centre’s questionnaire and COBATEST questionnaire. The centre explained which question(s) on their questionnaire was used to construct each indicator asked by COBATEST.

Part D: Trace and verification: Recount results from Phase 1: Assessment of data quality by dimensions, and compare the verified numbers to the site reported numbers and explain discrepancies. Assessing those possible reasons for discrepancies could include simple data

entry or arithmetic errors. The audit expert discussed possible explanations with the CBVCT service's coordinator.

7. Results

7.1. COBATEST network general analysis

Data received for 2015 and 2016 were submitted by 31 CBVCT services/networks from 11 European countries (Austria, Denmark, France, Italy, Latvia, Lithuania, Portugal, Slovenia, Spain and Ukraine), for the first half of 2015 by two CBVCT services/networks from two European countries (Czech Republic and Poland), for the first half of 2015 and whole year 2016 by two CBVCT services/network from Croatia and Spain, for the second half of 2015 and whole year 2016 by the CBVCT network from Germany and for the whole year 2016 by four CBVCT services/network from Spain. Annex 2 shows the list of all these 39 CBVCT services/networks together with the country (and region) where they operate, information on the period the data were submitted for, data submission mode, and format of submitted data.

The COBATEST network received data for a total of 95,493 clients who were tested for HIV with a screening test in the participating CBVCT services/networks in 2015 (for individual CBVCT services/networks the number varied from 8 to 43,097) and for a total of 72,916 clients who were tested for HIV with a screening test in 2016 (for individual CBVCT services/networks the number varied from 7 to 38,658).

7.2. Assessment of data quality by dimensions

7.2.1. Quantitative assessment

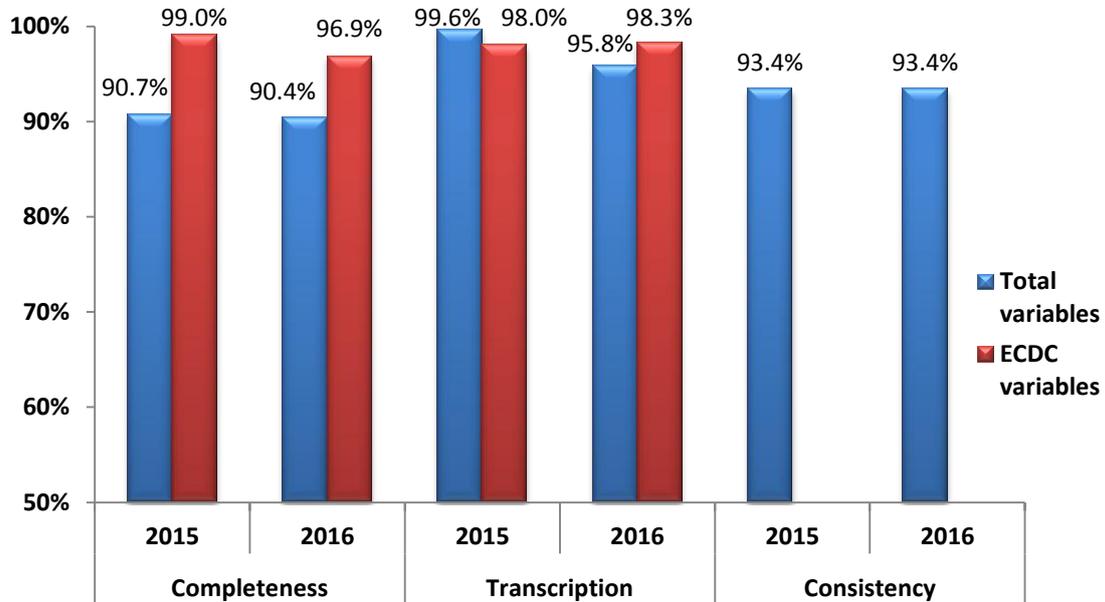
7.2.1.1. COBATEST network

The quantitative assessment was based on the analysis of three data quality dimensions of the total CBVCT services (39), completeness, transcription and accuracy, by year and by selected core variables for the COBATEST network and from the basic variables likely to be included in the core set of variables to monitor HIV testing at European level (Figure 2). For the all number of COBATEST services (39), comparing by year, it was found that completeness remained stable in the total set of selected COBATEST variables, whereas among the core set of variables to monitor HIV testing at European level this dimension decreased slightly from 99% to 97%.

Transcription remained stable comparing by year in the core set of variables to monitor HIV testing at European level, and decreased in the set of core variables of the COBATEST network from 99.6% to 95.8%.

Consistency was only evaluated for the total number of selected COBATEST variables and does not change year to year. This dimension had the lowest average (93.4%) compared to the other dimensions.

Figure 2. Completeness, transcription and consistency by selected core variables for the COBATEST network and for the basic variables likely to be included in the core set of variables to monitor HIV testing at European level, 2015-2016.



*Selected variables for the total COBATEST and the core set of variables to monitor HIV testing at European level are describe in annex 2

7.2.1.2. COBATEST Tool

Data from thirty CBVCT services were included in this analysis. For the core CBVCT variables (annex 3) in 2015, 36% of CBVCT services had a completeness index of less than 90, dropping to 20% in 2016. When considering the basic variables likely to be included in the core set of variables to monitor HIV testing at European level, 13.3% of CBVCT services had a completeness index of less than 90 in 2015, dropping to 0% in 2016, showing that overall completeness is the dimension with the largest improvement over time as compared to the other dimensions.

Transcription had the highest score among the assessed dimensions; however there were no changes over time in the average of the COBATEST or the core set of variables to monitor HIV testing at European level. Nevertheless, a decline was observed in the number of services with an index score lower that 90 from to 2015 to 2016, with the remaining number of services having an index score between 90 and 95, when compared by years. This means that over time there has been an improvement in the transcription dimension once the services have used to use the tool, but there were some CBVCT services that despite a slight improvement, still had problems with data transcription.

Table 1 shows that consistency did not improve over time as this is the dimension with the lowest index score compare to the others, and the one that reflects a problem across all CBVCT services. This is likely to indicate a tool-related problem rather than a data entry error at CBVCT sites.

Table 1. Completeness, transcription and consistency among CBVCT services using the COBATEST data entry tool, by selected core variables for the COBATEST network and for the basic variables likely to be included in the core set of variables to monitor HIV testing at European level, 2015-2016.

CBVCT services	Completeness 2015		Completeness 2016		Transcription 2015		Transcription 2016		Total selected variables	
	Total selected variables	Core Variables	Consistency 2015	Consistency 2016						
1	Red	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
2	Red	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
3	Yellow	Green	Red	Green	Green	Green	Green	Green	Yellow	Green
4	White	White	Green	Green	White	White	Green	Green	White	Yellow
5	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Yellow
6	Red	Green	Red	Yellow	Green	Green	Green	Green	Yellow	Red
7	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
8	White	White	Green	Green	White	White	Green	Green	White	Green
9	Red	Green	Red	Green	Green	Green	Green	Green	Yellow	Yellow
10	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Yellow
11	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
12	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green
13	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Yellow
14	Green	Green	Red	Green	Green	Green	Green	Green	Yellow	Yellow
15	Green	Green	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow
16	Yellow	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Green
17	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
18	White	White	Green	Green	White	White	Green	Green	White	Yellow
19	Green	Green	Yellow	Green	Yellow	Green	Yellow	Yellow	Yellow	Yellow
20	White	White	Green	Green	White	White	Yellow	Green	White	Green
21	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
22	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow
23	Green	Green	Green	Green	Green	Green	Red	Green	Green	Green
24	Yellow	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow	Yellow
25	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
26	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Red	Red	Yellow	Yellow
27	Yellow	Green	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Green	Green
28	Red	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow
29	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Red
30	Red	Yellow	Red	Green	Green	Green	Green	Green	Yellow	Yellow
COBATEST network	90.77	98.02	91.38	97.47	98.90	99.63	98.72	99.41	93.43	94.13

	Index >95
	Index 90-95
	Index <90
	Data not received

7.2.1.3. Disaggregated Data

Overall, the CBVCT services that sent data to the COBATEST network in a disaggregated manner (3) have improved the completeness of variables over time, especially among the basic variables likely to be included in the core set of variables to monitor HIV testing at European level. Although transcription is the variable that according to table 2 has not changed in either group of variables comparing 2015 with 2016, it is important to take into account that this analysis of data quality was performed after data was collected, processed and formatted to follow COBATEST guidelines, so it may underestimate the transcription error. Consistency was only analysed for the whole group of COBATEST core variables selected as priorities, and the results showed that although there was a slightly decrease comparing 2015 with 2016, the consistency score was very high.

Table 2. Completeness, transcription and consistency among CBVCT services sending disaggregated data, by selected core variables for the COBATEST network and for the basic variables likely to be included in the core set of variables to monitor HIV testing at European level, 2015-2016.

	Completeness 2015		Completeness 2016		Transcription 2015		Transcription 2016		COBATEST variables	
	COBATEST variables	Variables to monitor HIV testing at European level	COBATEST variables	Variables to monitor HIV testing at European level	COBATEST variables	Variables to monitor HIV testing at European level	COBATEST variables	Variables to monitor HIV testing at European level	Consistency 2015	Consistency 2016
1										
2										
3										
Index COBATEST network	90.77	98.02	91.38	97.47	98.90	99.63	98.72	99.41	99.09	98.43

	Index >95
	Index 90-95
	Index <90

7.2.1.4. Aggregated Data

For the sites that sent aggregated data (7), the only dimension that could be assessed was completeness (Table 3).

Level	Indicator	CBVCT service 1		CBVCT service 2		CBVCT service 3		CBVCT service 4		CBVCT service 5		CBVCT service 6		CBVCT service 7		TOTAL	
		2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Level 1	CBVCT 1: Number of clients tested for HIV with a screening test														NA	100%	100%
	CBVCT 2: Proportion of clients who reported to have been previously tested for HIV														NA	85.7%	83.3%
	CBVCT 3: Proportion of clients who reported to have been tested for HIV during preceding 12 months														NA	85.7%	83.3%
	CBVCT 4: Proportion of clients who reported to have been tested for HIV at the same CBVCT facility during preceding 12 months														NA	71.4%	66.7%
	CBVCT 5: Proportion of clients with reactive screening HIV test result														NA	100%	100%
	CBVCT 6: Proportion of clients tested for HIV with a screening test who received the results														NA	100%	33.3%
	CBVCT 7: Proportion of clients with reactive screening HIV test result who received post-result counselling														NA	100%	50%
	CBVCT 8: Proportion of clients with reactive screening HIV test result who were tested with confirmatory HIV test														NA	100%	50%
	CBVCT 9: Proportion of clients with positive confirmatory HIV test result														NA	71.4%	33.3%
	CBVCT 10: Proportion of clients with positive confirmatory HIV test result who received the conclusive confirmatory HIV test result at CBVCT facility														NA	28.6%	16.7%
	CBVCT 11: Proportion of clients with positive confirmatory HIV test result who received post-result counselling at CBVCT facility														NA	28.6%	16.7%
Level 2	CBVCT 12: Proportion of clients who received a pre-test counselling or pre-result counselling and were tested for HIV with a screening test														NA	71.4%	33.3%
	CBVCT 13: Proportion of clients with non-reactive screening HIV test result who received post-result counselling														NA	71.4%	33.3%
	CBVCT 14: Proportion of clients with negative confirmatory HIV test result who received the conclusive confirmatory HIV test result at CBVCT facility														NA	28.6%	0%
	CBVCT 15: Cost per client tested														NA	28.6%	33.3%
	CBVCT 16: Cost per HIV diagnosis														NA	28.6%	33.3%
Level 3	CBVCT 17: Proportion of clients who tested HIV positive at CBVCT sites who were linked to health care														NA	42.9%	33.3%
	CBVCT 18: Proportion of clients who tested HIV positive at CBVCT sites who were diagnosed late														NA	14.3%	0%

 Reported data
 Reported data, but not completely or with some specification
 Data not reported

7.2.1.5. Assessment by selected COBATEST core variables in CBVCT services that complete the COBATEST data entry tool.

When the assessment was performed for each variable (table 4), it was found that for the core set of variables to monitor HIV testing at European level completeness remained stable over the study period. However, important variables such as city of the CBVCT site and date of receiving screening test result have less than 90% completeness. Regarding CBVCT core variables, those used to build the definition of migrants (year of arrival to this country and if the client is a resident or a tourist) are incomplete, the same is seen in those variables used to define type of drug injection.

Important variables like: “did the client receive the screening HIV test result and date of receiving screening test result”, had a completeness rate around 85%. This might be explained by the fact that most of the COBATEST CVBCT services are using a rapid test, which means that at the moment of the clients’ visit, they receive the test result.

This analysis reflects the complexity of recording variables requiring a post-visit notification, such as: receipt of confirmatory HIV test result; date of receipt of confirmatory test result; linkage to healthcare system; date of linkage; first CD4 count result; date of the first CD4 count. Neither reached 80% completeness, even for an important variable such as linkage to care. In this variable it is also important to take into account that each CBVCT service has adapted the proposed COBATEST standard definition to their local setting and context.

Regarding transcription, CBVCT service name and the personal identifier are variables, which showed transcription issues, as many sites manually enter their names, rather than use a drop-down list. Client personal identifier was one of the variables that reflects the complexity of use personal client identifiers. In order to generate client’s personal identifiers, some CBVCT services use the method proposed by the network and others use other site-specific methods, which may not be adaptable to the COBATEST’s web-based data entry tool.

Finally, transcription issues were observed specifically for dates, as the specification of data format proposed by the network were not always followed.

Table 4. Data quality index score for completeness and transcription of selected COBATEST core variables in CBVCT services using the web-site data entry tool, by year.

Variable	Completeness		Transcription	
	2015	2016	2015	2016
	%	%	%	%
Name of the CBVCT site	100	100	87.6	80.4
City of the CBVCT site	79.3	78.8	100	
Type of the testing site	100	100	100	100
Date of visit	100	100	100	99.9
Personal identifier (CBVTC service or COBATEST identifier)	100	100	89.4	91.1
Gender	99.9	99.5	100	100
Date of birth	99.4	99.5	99.8	99.4
Foreign national	96.6	98.4	100	100
Country of birth	97.7	97.3	100	100
Year of arrival to this country	81.1	80.5	99.8	99.7
Is the client a resident or a tourist	80.9	77.7	100	100
HIV test in the past	99.7	99.6	100	100
Date of last test	94.4	94.7	20.4	27.4
Result of last test	97.5	97.0	100	100

HIV test in the last 12 months in this CBVCT facility	91.8	94.0	100	100
Sex in the last 12 months with/men/women/women and men/Any/Dont know	99.0	96.3	100	100
Condom use in the last sexual relation with penetration	94.4	95.2	100	100
Exchange of sex for drugs or money in the last 12 months	99.2	98.5	100	100
STI diagnosed in the last 12 months?	94.4	92.2	100	100
Ever in jail	86.0	85.0	100	100
Unprotected sex with penetration in the last 12 months with sex workers	95.5	95.1	100	100
Unprotected sex with penetration in the last 12 months with IDU	95.2	94.7	100	100
Unprotected sex with penetration in the last 12 months with known HIV positive partner	95.4	95.0	100	100
Unprotected sex with penetration in the last 12 months with MSM	95.7	95.1	100	100
Are you an intravenous drug use?	99.5	98.5	100	100
Date of last time of injection	75.4	73.9	83.7	84.1
Share of materials of injection in the last 12 months, as: Syringes or needles?	77.9	73.9	100	100
Share of materials of injection in the last 12 months, as: Spoons, filters; water	77.9	73.0	100	100
Pre-test/pre-result counselling performed	96.1	95.5	100	100
Date of specimen collection, screening HIV test	99.6	99.9	96.6	96.4
Type of test used	99.9	100	100	100
Reason for HIV testing	97.8	97.9		
Screening test result	99.9	99.9	99.2	99.5
Did the client receive the screening HIV test result	80.0	77.5	100	100
Date of receiving screening test result	86.3	84.7	96.0	96.2
Post-test HIV counselling performed	96.2	92.3	100	100
Confirmatory test performed	93.3	97.8	100	100
Date of specimen collection for the confirmatory HIV test result	40.9	63.0	98.1	95.4
Confirmatory HIV test result	98.4	96.4	100	100
Did the client receive the confirmatory HIV test result	60.6	65.9	100	100
Date of receiving confirmatory test result	34.6	47.8	97.7	95.5
Patient was linked to healthcare system	79.8	76.6	100	100
Date of linkage	48.2	60.3	92.7	91.8
First CD4 count result	31.6	27.3	100	100
Date of the first CD4 count	18.4	21.5	95.2	88.5
Index all COBATEST selected variables	89.6	90.3	96.0	95.8
Index ECDC variables	97.4	96.9	98.3	98.3

- Proposed core variables to monitor HIV testing at European level

7.2.1.6. Assessment by selected COBATEST core variables in CBVCT services that report disaggregated data.

Overall, data sent by the CBVCT service that use the disaggregated format are less than 90% complete in both years, and variables that are considered a priority such as: Screening test result and Confirmatory HIV test result are less than 95% complete. Transcription has improved over time; however it is important to take into account, as previously mentioned, that this data quality analysis has been performed after data was collected, processed and formatted to follow COBATEST guidelines, so transcription error may be underestimated.

Table 5. Data quality index score for completeness and transcription dimensions of selected COBATEST core variables reported in disaggregated manner per year.

Variable	Completeness		Transcription	
	2015	2016	2015	2016
	%	%	%	%
Personal identifier (CBVCT service or COBATEST identifier)	99.9	100		
Gender			99.9	99.8
Age in years	90.7	90.8	98.80	99.9
Date of birth				
Age group	86.32	91.07	96.27	99.6
Key population			100	100
Date of visit	96.31	91.06	100	100
Ever tested	100	100	100	99.9
Tested last year	100	100	100	100
Tested last year same CBVCT	100	100	100	94.8
Pre-test/pre-result counselling performed?	94.3	91.07	100	100
Screening HIV test	100	100	99.9	100
Screening test result	93.5	85.1	95.6	100
Date of receiving screening test result:			97.3	88.3
Did the client receive the screening HIV test result?	94.2	98.4	100	100
Post-test HIV counselling performed?	91.6	98.1	100	100
Confirmatory HIV test result	88.2	81.2	100	100
Did the client receive the confirmatory HIV test result?	24.5	96.6	100	100
Date of receiving confirmatory test result				
Post-test HIV counselling performed?	96.4		100	100
Did the client receive the confirmatory HIV test result?	100	83.1	100	100
Patient was linked to healthcare system?	100	100	100	100
Date of linkage			89.5	100
First CD4 count result	4.5			
Date of the first CD4 count			89.5	100
Index COBATEST selected variables	88.1	89	96.3	99.1
Index ECDC variables	82.7	94.2	98.7	98.4

■ Proposed core variables to monitor HIV testing at European level

7.3. Qualitative assessment

7.3.1. COBATEST Tool

For CBVCT services using the COBATEST data collection form and the web-based data entry tool, several challenges have been identified.

In the output from the COBATEST web-based data entry tool, the dates are extracted as string format. When the string is transformed to date format, the dates with 00 in the day and/or month appear as null and so this data is lost. The most problematic variable is “Date of last test” as the date is often an estimation (giving only month/year or only year).

CBVCT services report having issues with some of the questions used to construct the risk population variables. For instance, the question “Intravenous drug use?” is used to define PWID, but in this sense the question does not distinguish between current and former use of intravenous drugs, therefore it is not possible to attribute a weight to possible transmission route, e.g. sexual MSM or PWID.

The information related to the confirmatory test and linkage to care is obtained in the second part of the questionnaire alongside the rapid test information. CBVCT sites may fail to update the record when data on confirmatory test and linkage to care becomes available.

7.3.2. Disaggregated Data

For the CBVCT services sending their disaggregated data in an Excel file according to data file specifications, there have been some errors because the sites do not always follow the specifications for the variables. For example, in date formats: 1/9/2015 instead of 01/09/2015.

The guidelines for the COBATEST indicators explain that the different key populations at risk would not be mutually exclusive, so one individual who is MSM, PWID and migrant should be put in the three groups. On the contrary in the data specifications for disaggregated data, the variable “population at higher risk” appears to be mutually exclusive.

7.3.3. Aggregated Data

Some sites opt to submit only core indicators using the Excel reporting form. The Excel file includes formulas for calculating indicators, thus minimizing the possibility of error in this respect. However in this way information with regards to completeness, transcription and consistency of the variables collected at site level are not accessible.

7.4. Assessment of the functional components of CBVCT services data management

7.4.1. Administrative and organizational characteristics of the participating COBATEST services

Thirty-four out of 39 CBVCT services responded to the “Assessment of the Functional Components of CBVCT Services Data Management” survey, a response rate of 87%. Twenty-four of 24 respondents (71%) reported sending data to the COBATEST network through the data entry tool, two (6%) in a disaggregated manner and five (14%) in an aggregated manner (COBATEST indicators). Three CBVCT services (9%) reported not being able to send data. Table 1 shows the administrative and organizational characteristics of the participating COBATEST services in 2017, according to the method used to send data to the network.

Overall, most of the CBVCT services participating in the COBATEST network are NGOs (82.4%), funded by a public/governmental organization or co-funded by public and/or private entities (88.3%), which differ in size and in the kind of settings where their activities are implemented, among the activities all of them reported offering the HIV test. The settings included NGO offices (94.1%), outdoor settings (35.3%), venue settings (29.4%), health care settings (14.7%) and others (76.5%), including university campus, social centres and premises where prostitution commonly takes place.

Table 6. Administrative and organizational characteristics of the participating COBATEST services, comparing by method used to send data, 2017.

	CBVCT Services sending data through the web-based entry data tool n (%)	CBVCT services sending disaggregated data n (%)	CBVCT services sending aggregated data (indicators) n (%)	CBVCT services which were not sending data last year n (%)	Total COBATEST network n (%)
	24 (70.5)	2 (5.9)	5 (14.7)	3 (8.8)	34 (100)
Responsible for the management of the CBVCT service					
NGO	21 (87.5)	2 (100)	2 (40)	3 (100)	28 (82.4)
Public organization	1 (4.2)				1 (2.9)
Foundation	2 (8.3)		3 (60)		5 (14.7)
Other					
CBVCT service funding					
Public/governmental funded	12 (50)		1 (20)	1 (33.3)	14 (41.2)
Private – for profit	1 (4.2)				1 (2.9)
Private - not for profit	1 (4.2)				1 (2.9)
Co-funded public and private	9 (37.5)	2 (100)	3 (60)	2 (66.7)	16 (47.1)
Other	1 (4.2)				1 (2.9)
Number of people working at the CBVCT service including voluntaries (Mean-SD)	9 (8)	10 (3.6)	469 (680)		52 (220)
Number of voluntaries working at the CBVCT service (Mean-SD)	3 (5)	4 (3.6)	229 (384)		31 (141)
Settings were the CBVCT service' activities are implemented (answers are not mutually exclusive)					
NGO setting	23 (95.8)	2 (100)	5 (100)	2 (66.7)	32 (94.1)
Outdoor setting (van, street)	7 (29.2)	1 (50)	3 (60)	1 (33.3)	12 (35.3)
Venue setting (gay venue, sauna, disco, bar)	5 (20.8)	1 (50)	3 (60)	1 (33.3)	10 (29.4)
Health care setting	3 (12.5)	1 (50)	1 (20)		5 (14.7)
Other	19 (79.2)	2 (100)	3 (60)	2 (66.7)	26 (76.5)

CBVCT services: Community Based Voluntary Counseling and Testing services; **NGO:** non-governmental organization; **SD:** standard deviation.

7.4.2. Procedures followed by the CBVCT services

The primary key population in the COBATEST network is MSM (79.4%), followed by male sex workers (MSW) (56%) and transsexual/transgender population (56%). Table 7 shows the key population targeted by the participating CBVCT services in the COBATEST network, type of screening test used, and the procedures followed to confirm a positive reactive test and linkage to care.

The type of the screening test most commonly used is the rapid test on blood (finger prick) (67.6%), followed by the rapid test on oral fluid (38.2%). Seven centres (20.6%) reported using the conventional test on a blood sample as a screening test. The most used procedure to confirm a reactive positive test is referral of clients to a reference laboratory or Hospital HIV unit (64.7%). Regarding linkage to care, when CBVCT centres have a confirmed HIV positive client, the most common procedure to refer a client is sending them directly to a Hospital HIV unit (82.4%). However, three centres (8.8%) send clients first to primary health care services,

while two centres (5.9%) only inform clients and one (2.9%) treats clients directly at the CBVCT centre. Five (14.7%) CBVCT services reported that clients were always accompanied by someone from the centre to the first clinical visit, 23 (67.6%) offer the possibility of an escort to this first medical visit (but the offer is not usually taken up), and five centres (14.7%) reported not having this service available.

Table 7. Key population targeted, type of screening test used, and the procedures followed to confirm a positive reactive test and linkage to care, COBATEST network, by data submission method, 2017.

	CBVCT Services sending data through the web-based entry data tool n (%)	CBVCT services sending disaggregated data n (%)	CBVCT services sending aggregated data (indicators) n (%)	CBVCT services which were not sending data last year n (%)	Total COBATEST network n (%)
	24 (70.5)	2 (5.9)	5 (14.7)	3 (8.8)	34 (100)
Key population targeted by the CBVCT service (answers are not mutually exclusive)					
MSM	18 (75)	2 (100)	5 (100)	2 (66,7)	27 (79,4)
FSW	13 (54,2)		3 (60)		16 (47,1)
MSW	14 (58,3)		4 (80)	1 (33,3)	19 (55,9)
PWID	9 (37,5)		3 (60)	1 (33,3)	13 (38,2)
Male migrant	10 (41,7)		4 (80)	1 (33,3)	15 (44,1)
Female migrant	9 (37,5)		4 (80)		13 (38,2)
Transsexual/transgender	12 (50)	1 (50)	5 (100)	1 (33,3)	19 (55,9)
Young people	12 (50)	1 (50)	3 (60)		16 (47,1)
General population	14 (58,3)	1 (50)	2 (40)	1 (33,3)	18 (52,9)
Type of HIV tests used (answers are not mutually exclusive)					
Conventional test on blood sample	2 (8,3)	2 (100)	2 (40)	1 (33,3)	7 (20,6)
Rapid test on blood (finger prick)	16 (66,7)	1 (50)	3 (60)	3 (100)	23 (67,6)
Rapid test on oral fluid	11 (45,8)		1 (20)	1 (33,3)	13 (38,2)
Place where the confirmation is performed					
The confirmation test is performed at the CBVCT service	1 (4,2)		1 (20)		2 (5,9)
A blood sample is extracted and sent to a reference laboratory	1 (4,2)	1 (50)	1 (20)	1 (33,3)	4 (11,8)
The client is referred to a reference laboratory or to a Hospital HIV unit	18 (75)	1 (50)	1 (20)	2 (66,7)	22 (64,7)
It is recommend to the client to go to a health care centre	2 (8,3)		1 (20)		3 (8,8)
Other	2 (8,3)		1 (20)		3 (8,8)
Referral procedure for HIV+ diagnosed clients					
Clients are referred to a Hospital HIV unit.	21 (87,5)	2 (100)	2 (40)	3 (100)	28 (82,4)
Clients are referred to their Primary Health Care centre	2 (8,3)		1 (20)		3 (8,8)
Clients are just informed about the Health Care centres existing.	1 (4,2)		1 (20)		2 (5,9)
Other			1 (20)		1 (2,9)
Accompanied visits to health care settings					
Yes, always	5 (20,8)				5 (14,7)
The possibility is offered	16 (66,7)	2 (100)	3 (60)	2 (66,7)	23 (67,6)

	CBVCT Services sending data through the web-based entry data tool n (%)	CBVCT services sending disaggregated data n (%)	CBVCT services sending aggregated data (indicators) n (%)	CBVCT services which were not sending data last year n (%)	Total COBATEST network n (%)
	24 (70.5)	2 (5.9)	5 (14.7)	3 (8.8)	34 (100)
No	3 (12,5)		1 (20)	1 (33,3)	5 (14,7)
Don't know			1 (20)	1 (33,3)	2 (5,9)

CBVCT services: Community Based Voluntary Counseling and Testing services; **MSM:** men who have sex with men; **FSW:** female sex worker; **MSW:** male sex worker; **PWID:** people who injects drugs.

7.4.3. Assessment of Data Management System

The six functional areas of a data management and reporting systems vary greatly according to the method of data submission used by the CBVCT centres within the COBATEST network. This analysis describes the functional areas of a data management and reporting system that were assessed by method used to send data to the COBATEST network, 2017.

7.4.4. M&E capabilities, roles and responsibilities

When the M&E capabilities, roles and responsibilities were assessed overall (Table 8), it was found that around half (53%) of CBVCT centres have a documented organizational structure that identifies roles for data management, more than half (61.8%) of the centres have training plans on data management both for the staff and volunteers, 56% of the centres have someone responsible for reviewing the quality of data but just 41.2% have designated staff responsible for reviewing the quality of aggregated numbers or the digitalization of data prior to the submission to the COBATEST network. The assessment of the tool in this functional area gave almost the same results as the COBATEST network as a whole, probably due to the fact that the majority of centres that answered the survey use the data entry tool.

On the other hand, given the small number of CBVCT services that do not use the data entry tool and answered the survey, the results from the assessment of the functional areas of data management and reporting are partial and not representative of the different CBVCT services. However, it was observed that services that send disaggregated data have nobody designated to review the data quality and oversee the submission of data to the COBATEST Network. For services sending aggregated data, most centres (n=4) have a documented organizational structure, with designated people for reviewing data quality, and among the five centres three have someone responsible for reviewing aggregated numbers prior to submission to the network.

Table 8. M&E capabilities, roles and responsibilities, COBATEST network, 2017

	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)

There is a documented organizational structure/chart that clearly identifies positions that have data management responsibilities at CBVCT service	18 (52,9)	8 (23,5)	5 (14,7)	3 (8,8)
There is a training plan which includes staff involved in data collection and reporting process	17 (50)	11 (32,4)	2 (5,9)	4 (11,8)
All staff including volunteers received training on the data management processes and tools	21 (61,8)	8 (23,5)	3 (8,8)	2 (5,9)
There is a senior staff member (e.g., the Program Manager) responsible for reviewing the data sent to the COBATEST network	15 (44,1)	7 (20,6)	6 (17,6)	6 (17,6)
There are designated staff responsible for reviewing the quality of data (i.e., accuracy, completeness and timeliness)	19 (55,9)	8 (23,5)	4 (11,8)	3 (8,8)
There are designated staff responsible for reviewing aggregated numbers or the digitalization of data prior to submission to the COBATEST network	14 (41,2)	8 (23,5)	4 (11,8)	8 (23,5)
There is responsibility for recording the delivery of services on source documents clearly assigned to specific staff o member/s at the CBVCT service	26 (76,5)	2 (5,9)	2 (5,9)	4 (11,8)

7.4.5. Indicator definitions and reporting guidelines

The answers from “Indicator definitions and reporting guidelines” functional area (table 9) find that 76.5% of all CBVCT services participating in the network are using data collection guidelines, but just 52.9% are using the COBATEST network guidelines (table 9). A higher proportion (66.7%) of services using the web-based data entry tool are using the COBATEST indicator guidelines than those sending aggregated data. Services sending disaggregated data do not use the COBATEST guidelines at all, and one of these services reported using other guidelines.

Table 9. Indicator definitions and reporting guidelines, COBATEST network, 2017

	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
CBVCT service follow any data collection guidelines	26 (76,5)	3 (8,8)	1 (2,9)	4 (11,8)
There is a main document which describes the way to built each variable or indicator measured by the CBVCT service	18 (52,9)	7 (20,6)	6 (17,6)	3 (8,8)
The CBVCT service use the COBATEST indicator’s guidelines to built the indicators measured	18 (52,9)	12 (35,3)	2 (5,9)	2 (5,9)
The CBVCT service share the definition of the indicator(s) measured by the CBVCT service with all the people involved in data collection and manipulation at the service	18 (52,9)	12 (35,3)	1 (2,9)	4 (11,8)
The manager has read the COBATEST indicator’s guidelines	26 (76,5)	5 (14,7)	2 (5,9)	1 (2,9)

7.4.6. Data collection and reporting tools and forms

In the section “Data collection and reporting tools and forms” 82.4% (28) of the services report having instructions on how to complete the data collection and reporting forms, and 76% (26)

provide the reporting forms to all the people working with data at the services, when compared to the services using the web-site data entry tool the percentages are pretty similar, 75% and 79.2%, respectively (table 10). All services sending aggregated data reported having instructions to complete the data collection available. We also found that the staff from the CBVCT services that are sending disaggregated data are using the document to describe indicators, data collection and reporting forms/tools.

Table 10. Data collection and reporting tools and forms, COBATEST network, 2017

	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
The CBVCT service provides standard reporting forms/tools to be used by all the people working with data at the CBVCT service	26 (76,5)	4 (11,8)	2 (5,9)	2 (5,9)
There are clear instructions on how to complete the data collection and reporting forms/tools	28 (82,4)	4 (11,8)	1 (2,9)	1 (2,9)
Members of the CBVCT service use the documents which describe indicators, data collection and reporting forms/tools	18 (52,9)	8 (23,5)	4 (11,8)	4 (11,8)
All the main documents and reporting forms are relevant for building the CBVCT service's indicator(s) available for auditing purposes	14 (41,2)	14 (41,2)	2 (5,9)	4 (11,8)

7.4.7. Data management processes

This functional area is the one with greatest weaknesses as just three services from the whole COBATEST network had a written procedure to address any quality error, only 35.3% (n=12) of the surveyed services performed quality control and 29.4% (n=10) have an established procedure to resolve any discrepancies or inconsistencies found in the datasets (table 11). These percentages are similar to those observed in services using the web-site data entry tool. Only 44.1% of the COBATEST services surveyed have a defined process to take into account double counting of people coming to the service more than once during the year.

Regarding the protection of the relevant personal client data according to national or international confidentiality guidelines, 91.2% of all surveyed services responded that they follow the guidelines, just one service that sends its data through the web-site data entry tool reported not following any guidelines and one CBVCT service follows guidelines partially.

Finally, when the process to ensure proper follow-up of people that have been linked to care was assessed, it was found that just 10 CBVCT services surveyed from the whole network have a procedure in place, most (9) of those belonged to the group of the centres submitting data using the COBATEST web-site data entry tool.

Table 11. Data management processes from the whole COBATEST network, 2017

	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
There is at your CBVCT service a written procedure to address incomplete, inaccurate, and/or missing reports	3 (8,8)	5 (14,7)	23 (67,6)	3 (8,8)
There are quality controls performed after the paper data is entered on the computer? (e.g., double entry, post data entry verification, etc).	12 (35,3)	10 (29,4)	11 (32,4)	1 (2,9)
If data discrepancies are identified, is there any standard procedure to document and resolve these inconsistencies	10 (29,4)	10 (29,4)	11 (32,4)	3 (8,8)
Relevant personal client data are maintained according to national or international confidentiality guidelines.	31 (91,2)	1 (2,9)	1 (2,9)	1 (2,9)
There is a process to ensure proper follow up of people that have been linked to care	10 (29,4)	12 (35,3)	6 (17,6)	6 (17,6)
There is a process to take into account double counting of people coming to your CBCT service more than once during the reporting period	15 (44,1)	8 (23,5)	7 (20,6)	3 (8,8)

7.4.8. Links with the national reporting system

From the CBVCT services that responded to the survey, just 16 centres (47.1%) are reporting data to the national information system or national authority. It is important to bear in mind that 11 centres belong to the “DEVO Network”, which is a network that was created in Catalonia-Spain with the help of the Regional Surveillance System, thus this might bias the result of this question. All CBVCT services surveyed that are sending disaggregated data and three services that are sending aggregated data, are also sending data to their national surveillance systems (Table 12).

Among the 17 CBVCT services that reported sending data to the national information system or national authority, the majority of sites only received partial (3) or no training (8) on the submission of data to the national authority. Only three of the respondents reported having a full meeting with the national counterpart to set up the system. The type of data submitted to the national system varies, with an equal number sending disaggregated (5) and aggregated (5) data. The method of reporting also varies between paper (2), web service (6) and email (5). When all CBVCT services were asked what they thought was the most appropriate method to send data to the national surveillance system, there is broad agreement that web service (8) or email (5) would be the most appropriate way to submit data. One site would prefer to submit data in a meeting so that the results can be discussed with the national authority. One site has doubts about the confidentiality of the new system the national authority is planning which would standardise questionnaires across the country’s CBVCT services.

Table 12. Links with the national reporting system from the whole COBATEST network, 2017

	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
There are data from your CBVCT service reported to the national information systems or national authority	16 (47,1)	1 (2,9)	11 (32,4)	6 (17,6)
National authority showed interest in integrate the data collected by the CBVCT service into the national datasets	12 (35,3)	8 (23,5)	9 (26,5)	5 (14,7)
There is any proposed initiative to integrate your CBVTC service data into the regional or national datasets	7 (20,6)	8 (23,5)	9 (26,5)	10 (29,4)

7.4.9. Data use

Of all CBVCT services surveyed, 61.8% (n=21) reported that the service analyses the collected data in an independent manner from the COBATEST network for internal purposes, 41.2% (n=14) use the information generated by the COBATEST network, and 11.8% (4) make decisions based on the collected data. The percentages related to use of information and decision-making based on the collected data are higher among the services which are using the web-site data entry tool; 54.2% and 58.2% respectively (Table 13).

Three services reported using their own web-based data entry tool alongside COBATEST's. Four sites responded that they did not use the COBATEST's web-based data entry tool as they needed data which were not included in the questionnaire and one reports that they had to use the national information system's data collection form.

Twenty-eight sites report using the COBATEST tool for data extraction, using either the indicators report from the COBATEST web-site data entry tool (16) or the Excel files (12). This suggests that the data extraction functions of the COBATEST tool are useful for most sites. The extracted data is most commonly used to follow the CBVCT's daily activities (17) indicating the databases of most of the sites are kept up-to-date and consulted frequently.

Table 13. Data use from the whole COBATEST network, 2017

	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
The CBVCT service's project manager and data manager have access to collected data	26 (76,5)	1 (2,9)	2 (5,9)	5 (14,7)
The CBVCT service analyses the collected data in an independent manner from the COBATEST network for internal purposes	21 (61,8)	9 (26,5)	3 (8,8)	1 (2,9)
The CBVCT service uses the information generated through the COBATEST network tools, e.i. indicators, variables, export data, etc.	14 (41,2)	8 (23,5)	8 (23,5)	4 (11,8)

Program/service staff make decisions based on the collected data

4 (11,8)

5 (14,7)

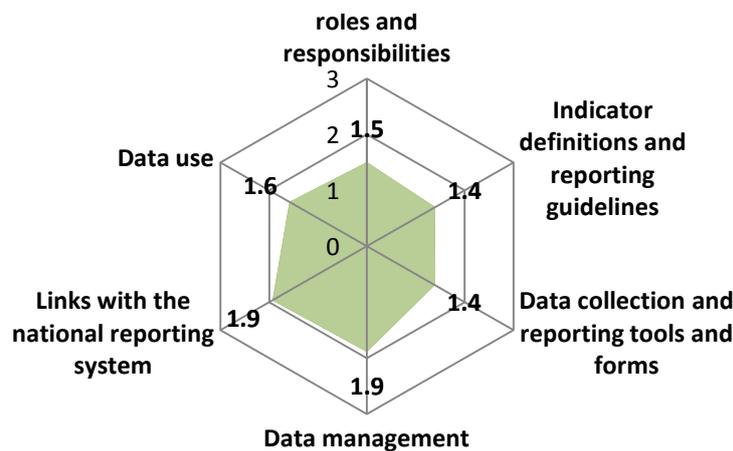
3 (8,8)

22 (64,7)

7.5. Overall COBATEST Network Assessment of Data Management and Reporting Systems.

Overall, the COBATEST network assessment of Data Management and Reporting Systems showed that the scores in general are low among the five assessed functional areas. Those linked to the national reporting system had higher scores, however this could be explained by the fact that 11 centres that reported having links to the national/regional surveillance system belong to the “DEVO Network”, as was mentioned before. This large number of Catalan centres might bias the result of this question and increase the score in this functional area (Figure 3).

Figure 3. Overall COBATEST Network Assessment of Data Management and Reporting Systems



7.6. Data Quality Audit Site Visits and Meetings

Table 14. List of site selected for the site visits by method of data submission to the COBATEST network and description of staff responsible for data at the CBVCT service

Method of data submission	Site identifier	Staff responsible for the data at the CBVCT service
Submit data using the COBATEST web-based data entry tool	Site 98	Counsellors also does testing and updates the online tool
	Site 17	Different staff are responsible for counselling and testing
	Site 65	Counsellors also do testing. A different member of staff is

		responsible for updating the tool.
Submit disaggregated data	Site 14	The same staff are responsible for counselling and updating the site's data collection tool. Different staff are responsible for testing. Administrative staff are responsible for submitting data to COBATEST.
	Site 75	The same staff are responsible for counselling, testing and updating the site's data collection tool. A database manager is responsible for submitting data to COBATEST.
	Site 51	The same staff are responsible for counselling and updating the site's data collection tool. Different staff are responsible for testing. Data is submitted to a governmental health body before submission to COBATEST.
Submit aggregated data	Site 77	The same staff are responsible for counselling and testing. Staff in the VCT centre are responsible for updating the site's data collection tool which is sent to headquarters.
	Site 10	The same staff are responsible for counselling, testing and updating the site's data collection tool. The data is submitted to headquarters before submission to COBATEST.

7.6.1. M&E Structures, Functions and Capabilities

7.6.1.1. Identification of M&E and data management staff with clearly assigned responsibilities

The identification of M&E and data management staff depended broadly on the size of the organisation. The organisations either had data management staff or assigned data management responsibilities to employees involved in VCT. Some tasks were assigned on an ad-hoc basis depending on which staff were available, but this was generally limited to data entry that required less expertise. Group A were the smallest sites, and each had one or two staff tasked with transferring paper questionnaires to the COBATEST web-based data entry tool and analysing the output to create reports for the organisation. Group B have members of

staff dedicated to data management, but the task of data entry falls to the counsellors or whoever is available in the centre. For instance, site 14 assigned data management tasks to people doing 9-month placements, depending on the skill set of the person (some have done data entry while another coded the database output for submission to COBATEST). Sites in Group A tended to be the smallest organisations and had less need for data management staff but assign all tasks to specific staff members. Groups B or C had defined data management staff but did not usually assign data entry tasks to specific staff members which presents a problem as most organisations do double data entry (first on paper then transferred online).

7.6.1.2. *Training of data-management and VCT staff*

All organisations ensure that VCT staff are trained in how to use the questionnaire in a consultation. In larger organisations there is a separation between VCT and data management activities which is reflected in the training. The staff in organisations with links to academic institutions or government bodies are more likely to receive data management training. The smaller organisations have less formal training processes in place but benefit from high staff retention, reducing the need to train new staff regularly.

Each site in Group A have staff who were involved in the original COBATEST project and are familiar with the guidelines for data collection. The training for VCT staff in Group C includes aspects of data collection but both sites in Group C have dedicated data management staff that collaborated in the creation of the COBATEST data collection guidelines. Sites that rely on temporary staff (e.g. interns), sometimes benefited from those staff having expertise in areas such as IT but then faced issues if the replacement staff did not have the same skills.

In smaller organisations the staff have multiple jobs, monitoring and evaluation being one, and benefit from the existing COBATEST Network guidelines for data collection. The larger organisations have dedicated and qualified database managers and some have staff who were involved in the creation of the COBATEST Network guidelines.

7.6.2. *Indicator Definitions and Reporting Guidelines*

7.6.2.1. *Operational indicator definitions created by the COBATEST network are systematically followed*

In general, the questionnaires used by sites not using the COBATEST tool were created with the COBATEST requirements in mind and are broadly comparable aside from the issues highlighted below. This section covers discrepancies in the data collection of each CBVCT indicator and possible explanations for missing data.

a) Unique Identifier (CBVCT 1)

As noted in section 6.2.2, not all centres use a unique identifier and those that do adapt and individualise the definition of unique identifier to the context of their CBVCT service. All sites in Group A use the COBATEST unique identifier. In Group B, Site 51 uses the

COBATEST unique identifier, Site 75 does not use a unique identifier and Site 14 uses an identifier, which may permit duplicates. Site 14 is reticent to use the COBATEST identifier because they feel it is intrusive and will occupy too much time. Site 75 expresses concerns about confidentiality. In Group C, Site 77 does not use a unique identifier and so their count is for visits not people. Site 10 uses a unique identifier for all clients that consent to participate in the database, but those who opt out and those who are tested in outreach do not have a unique identifier.

b) Key Population at Higher Risk (CBVCT 1)

As noted in section 6.2.2.2, sites that submit disaggregated data are treating “Key Population at Higher Risk” as a categorical variable, while the other sites are counting some clients in more than one risk group.

c) Pre-/Post-test Counselling (CBVCT 7)

Sites in Groups B and C do not explicitly collect information on pre- and post-test counselling in their questionnaire as the assumption is that all clients who are tested receive some level of both.

d) Confirmatory Tests (CBVCT 8, 9, 10)

As noted in section 6.2.1, the majority of centres do not perform confirmatory testing in-house and must refer clients to a HIV Unit. The completeness of these indicators thus depends on the site’s follow-up with the client and referral unit.

In Group A, sites are able to collect good data on confirmatory tests because of the strong links to the local HIV Units. In the case that a client goes to a different unit they do not follow up.

In Group B, one site gives confirmatory results in the centre and can record it in this way. Another site depends on communication from the HIV Unit but this is not always reliable as the unit may not know if the client was referred from this CBVCT site or somewhere else. They are working on using an identifying number in the referral to improve follow-up. There is a site that records confirmatory tests through follow-up with client (which includes accompaniment to appointments).

In Group C, one site doesn’t record data on confirmatory tests and the other site tries to stay in touch with clients to record confirmatory results but manages this with only 41% of the clients with a reactive screening. The latter estimates that a quarter of people with reactive tests already knew their status and it is not clear if these cases are counted in the confirmatory test results.

The centres that use the COBATEST questionnaire record VCT data and confirmatory test data in the same place while in other sites the data may be recorded in two separate places and not merged. This means Groups B and C may be submitting data on confirmatory tests that is incomplete.

e) Linkage to Care (CBVCT 17)

Definitions of linkage to care vary widely. Some do not define it, some define it as providing the client with information on where to seek a confirmatory test, some define it as attendance (confirmed by either the HIV Unit or client) at a confirmatory test appointment, and some define it as ART initiation.

7.6.2.2. Centers have documented what is reported to who, and how and when reporting is required

Only larger sites have written documentation on reporting periods. Group A have no written documentation but given that they regularly update the COBATEST database and data can be extracted when necessary it is less problematic than it would be for larger sites.

7.6.3. Data Collection and Reporting Forms and Tools

7.6.3.1. Standard data-collection and reporting forms are systematically used

Each centre uses a standardised data collection form but the way of implementing it is different within and across centres. Some sites ask counsellors to complete the form with the client present, while others have an open discussion with the client and then complete the form from memory after the client leaves. The sites that do the latter cite making the client more comfortable as the reason. Most sites use paper questionnaires.

Group A use paper copies of the COBATEST tool which are later transferred online. In Group B, in one site counsellors complete the questionnaire online after the consultation and in other site the questionnaire is completed on a tablet with every client. In Group C, on one site completes two forms with the client (sometimes online and sometimes on paper and then transferred later); the first a basic data collection and the second the full questionnaire if the client agrees to participate in the database.

7.6.3.2. Data are maintained in accordance with international or national confidentiality guidelines

All organisations report going beyond what is asked of them by the national confidentiality guidelines.

7.6.3.3. Documents and database are kept and made available in accordance with a written policy

The majority of sites work with paper questionnaires which they file on site, in locked storage. However there are some sites that do not have a written policy on how to store source documents. Other sites have recorded how long they keep source documents and when they

can be destroyed. One site has a comprehensive system to ensure data security, kept according to a written policy. It involves storing unique identifiers and questionnaires separately and encrypting all databases and communication that have client information.

7.6.4. Data Management Processes

7.6.4.1. Data are the most current practically available?

Given that most sites are working with paper questionnaires, the key to the data availability is the lag between data collection and data entry.

Group A reported having the database updated within a few days of the consultation. In Group B, responses varied. One site's database was updated by counsellor immediately after consultation or, in the case of outreach, around one week later. Another site updates their database once a week and another uses a tablet in the consultation, making it the most up-to-date. In Group C, the centres (not headquarters) are usually responsible for transferring data from paper to online database. Clients not included before the database is closed are identified because of the discrepancy between the reports on the actions of the centre and the online count.

Sites which update their database regularly and permit access to the data (like the COBATEST tool) ensure data is always ready to make programme management decisions.

7.6.4.2. Does clear documentation of collection, aggregation and manipulation steps exist?

Group A had the instruction manual on the COBATEST tool available and their data did not require manipulation beyond the COBATEST output. Groups B and C had the Work Package 4 guidelines available and some had prepared additional documents to aid data manipulation for submission to COBATEST.

7.6.4.3. Are data quality challenges identified and are mechanisms in place for addressing them?

Most sites have mechanisms for identifying data quality challenges as a by-product of the processes that are in place rather than a coherent strategy to improve data quality. All organisations have a parallel record of the number of tests and number of reactive tests that can be compared against their database.

Group A use paper questionnaires during the consultation, which one person then submits to COBATEST. This process allows for double checking of a questionnaire, mostly for missing fields or transcription issues. The person who completes the questionnaire can then be contacted to resolve any doubts. The flipside of this is that two people in the chain of data entry may leave room for error when inputting data online, especially if they must input many questionnaires at a time.

In Group B, sites report checking data quality by eye balling the Excel, looking for missing data. In this way, one site identifies the counsellors who are not asking specific questions and flags it up. Another site has a triple record of tests and reactive tests which ensures the quality of these figures.

Group C have the clearest mechanisms for checking data quality, possibly because they have centralised data collection and more risk of error. One site has a record of every action (i.e. testing session) which the centre completes with the basic information which can be checked against the database. Beyond resolving those discrepancies, they leave the responsibility for the data quality to the respective centre coordinators. Another site uses the database to produce reports for each centre which are then sent to the centre coordinators to be validated before publishing. Using the COBATEST web-based data entry tool reduces quality challenges in the manipulation of data, but centres are lacking a systematic way to address errors in the transfer from paper to digital record. Group B and C are aware of data quality challenges but most have not systematised quality checks.

7.6.4.4. Are there clearly defined and followed procedures to periodically verify source data?

Of the centres which use paper questionnaires, none have a clearly defined system for double checking data entry.

7.6.5. Links with National Reporting System

7.6.5.1. Does the data collection and reporting system of the programme/project link to the National Reporting System?

By and large, the National Reporting Systems, if they exist, collect much more basic data than that which is collected by the sites as the requirements from National Reporting Systems are minimal in the sites visited.

Two sites of three in Group A and all sites in Group C send a monthly summary of activity to the regional/national authority. The data submitted is basic, including the number of tests, reactive tests and sometimes the number of each risk group. In Group B, sites report basic data regularly to the national reporting system.

8. Discussion

The aim of this evaluation was to perform a data quality assessment of the data collected by the COBATEST network based on qualitative and quantitative assessments of the data submitted in three different formats (using the web-based data entry tool, aggregated and disaggregated data), comparing 2015 and 2016, and by taking into account two different sets of variables, COBATEST and ECDC core variables.

This assessment has identified a number of weaknesses in the data quality of the COBATEST network; such as low identification and designation of M&E capabilities, roles and responsibilities among the CBVCT services' staff; poor use of the COBATEST guidelines; lack of identification of clear written procedure to address any quality error and procedures to resolve any discrepancies or inconsistencies found in the datasets; and without taking into account the DEVO Network, the CBVCT services do not have a clear guidance to send their data to the national/regional surveillance systems. There was also identified that the COBATEST proposed definitions for client personal identifier, linkage to care and risk transmission groups need to be re-defined to create a more standardised definitions.

Also this assessment has demonstrated in the CBVCT services, dedicating human resources to maintain data quality is a considerable challenge. A workforce already burdened by daily activities requires approaches that minimize and streamlines data-related tasks. While increasing human resources to support data-related duties may be resource-intensive, this assessment highlights the importance of attention to task of existing staff, which is a less costly approach. The development of a skills and tasks inventory would be a relatively low-resource first step in clarifying staffing needs for the generation and use of strategic information.

In addition to examining staffing patterns to streamline data-related tasks, the data from this assessment suggests several simple, practical capacity development approaches to strengthen CBVCT services' data management by improving data, its use, and quality assurance processes. This would include centralization of training and mentoring initiatives, which could be led by the COBATEST network. Such continuous and standardised training would allow for support at the point of data generation.

Job training and mentoring is an effective approach for strengthening M&E capacity and ensuring data quality within the COBATEST network. The centralization of data quality capacity-building activities can be supported by the network through the creation of standardized materials for training and mentoring on CBVCT service information. This may include modification of already existing materials into a web-based single source of information containing: indicator definitions, guidelines on collating/aggregating, auditing procedures, as well as other steps of data collection, handling, analysis, and reporting.

Resource intensive investments that can improve data quality include strengthening electronic health information systems and harmonizing data collection systems/methods. Computerized point-of-care CBVCT services' information (web-based data entry tool), have the potential to dramatically reduce the data collection burden by automating data aggregation and reporting.

In the context of the COBATEST network it would be advisable that all CBVCT services use the data entry tool as this will reduce error, data collection burden and allow for real-time access to data. However the findings indicate that it should be further improved and adapted to services' data needs. Data from the present assessment indicate that this potential has not yet been reached as the electronic systems in place are incomplete, lack integration, are unreliable, and create a double reporting burden as data are often captured in both paper-based and electronic systems.

Also, the present assessment suggests using multiple methods of data collection, management and reporting puts a burden on the M&E activities. The lack of integration of data methods is a common challenge facing CBVCT M&E activities. Therefore, the parallel data collection methods identified in this assessment increases reporting burden and risk of confusion among CBVCT service staff. While advances in information technology can enable large volumes of data to be processed and analyzed quickly, the success is highly dependent on having adequate hardware, sufficient internet access, and common data architecture between systems, IT professionals, and support to ensure systems maintain functionality.

An additional, relatively high-resource investment suggested by the data in the current assessment is the harmonization of data collection in all the CBVCT services. This would include the development of essential data sets, through a timely, intensive, and consultative process for it to be effective. Such data set would include a selection of key variables likely to be included in the core set of variables to monitor HIV testing at European level. This selection at the same time could serve the CBVCT services to fulfil their data needs in order not to represent a double burden of work for the services.

Throughout the study phases the client identifier is confirmed to be an important variable. However it is completed partially or collected or/and built in a different way depending on the CBVCT site, which makes it unreliable and difficult its use to control for duplicates across the network, including between the CBVCT services. There is clearly the need for further work on this with all the participating CBVCT services in the network in order to reach a consensus on a new approach to create an indicator that is suitable, reliable and used homogeneously. A consensus must also be reached on the definition of transmission routes, as the way that it is collected and interpreted at present does not accurately reflect the groups, which CBVCT services' clients belong to.

Finally, excluding the DEVO CBVCT services (Catalan) centres, the linkage of CBVCT data with the local/ regional/ national surveillance HIV systems is very limited. Some CBVCT sites describe engaging in preliminary attempts but there is no defined data process integration in place to implement it. Therefore, this is one of the tasks for the COBATEST network identified from this assessment, which will include the consolidation of the network as an important source of strategic information and the connection to national HIV surveillance systems to create this data link.

A limitation of this assessment was the focus on CBVCT services participating in the COBATEST network. Nevertheless, it is likely that the findings would be applicable to other CBVCT services. On the other hand, as participants were fully aware of the purpose of the assessment,

they may have exhibited a social desirability bias, expressing to interviewers what they know are the policies concerning data management and reporting, rather than explaining the current procedures at their site. Despite the limitations of assessing a large quantity of data in three different formats, the evaluation exercise succeeded in making a quality data analysis from different perspectives and using a variability of data quality assessment methods. The findings showed that CBVCT services collect and manage strategic information to increase the evidence on the need for strengthening community-based service delivery models as an integral part of the HIV strategic investments, and to be used as an important source of information contributing to support quality services along the HIV care cascade and as important information to be collected by the data surveillance systems.

9. Conclusions and recommendations

This assessment has identified weakness in the data quality of the COBATEST network, which will likely need to be addressed to effect the most substantive and sustainable impact. CBVCT services' data quality is critical in ensuring that appropriate conclusions are drawn from the information captured at the CBVCT services. Besides, the perception that data collected by the COBATEST network are reliable, can significantly influence how organizations respond to data and use it, how the rest of the stakeholders and the HIV European organizations see the strategic information collected by the CBVCT services, and how these data can be integrated into formal surveillance system at national and regional levels.

Despite the lack of representative of the COBATEST network across Europe, we believe that the network serves as a sentinel source of HIV testing information , and it is considered relevant and of added value as it provides a unique EU-level perspective.

Based on the evaluation findings, a set of key recommendations have been highlighted:

- The development of a CBVCT/COBATEST Standard Operating Procedure (SOP) could be a relatively low-resource first step in clarifying staffing needs and processes for the generation and use of strategic information as well as for the set-up of standardized quality assurance processes among the COBATEST participating CBVTC services. This may include modifying and merging already existing site-specific documents as a single source of information containing indicator definitions, guidelines covering collating/aggregating, auditing procedures, as well as other steps of data collection, handling, analysis, and reporting.
- In the context of the COBATEST network it would be advisable that all CBVCT services use the web-based entry data tool as this will reduce error, data collection burden and it would also allow for real-time access to data.
- There are two important groups of variables that need to be addressed by the network, one is the personal identifier and the other is the risk group, as currently there are no standard definitions to be followed and that could be adapted to CBVCT services context.

- This data quality assessment has served to identify shortcomings of the existing web-platform that need to be addressed to improve its utility and usage.
- COBATEST network should work on provide operational support, coordination and IT support at the stage of data collection and analysis.
- M&E activities should be centralized by the network, and they should include training, mentoring initiatives and fostering data use (including dissemination) for evidence-based decision-making.
- Streamlining indicators and selection of a core set of variables that could be used to monitor HIV testing at European level is needed. Therefore, COBATEST network should create a process of selection of key variables to be collected, serving both the purposes of supporting service monitoring and contributing to European-level monitoring, while reducing the data collection and management burden for the CBVCT sites. This process should be in line with European level initiatives, such as the Joint Action INTEGRATE or the Dublin Declaration monitoring process.

10. References

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Annex 1 Standardized COBATEST data collection form



HIV TESTING DATA COLLECTION FORM



Name of the CBVCT site: _____ Testing site: CBVCT office Public venue (pharmacy, library, ...)
 Outdoors/Van Amusement venue (coffe, bar, ...)
 Sex work venue Needle exchange venue
 Sauna/sex venue Other: _____

City of the CBVCT site: _____

Date of visit: _____
Day Month Year

User's unique identifier (used by the CBVCT service): _____
 OR
 User's unique identifier (COBATEST): _____
Gender (0 male, 1 female, 2 transgender) Day Month of birth Year N° of older brothers N° of older sisters initial letter of mother's first name

Client's characteristics data:

Gender: Male Female Transgender Date of birth: _____
Day Month Year

Foreign national: Yes No Don't know Country of birth: _____
 Is the client a: Resident Tourist
 Year of arrival to this country: _____
(if migrant) Year

Municipality or home town: _____

Reasons for HIV testing: (multiresponse)

Risk exposition For control/screening Window period in the last test Clinical symptoms

Unprotected vaginal sex My partner asked to me
 Unprotected anal sex Before dropping using condom with my partner
 Unprotected oral sex I wish to have a baby
 Broken condom Prenatal screening before delivery
 Unprotected sex with sex worker Regular control
 My partner has tested positive recently Only to know my health status
 Episode of sharing injection material Other: _____
 Other: _____

Reasons for come to this CBVCT service to be tested: (multiresponse)

I've come here before I've seen this CBVCT in a pamphlet Other: _____
 A friend told me about this CBVCT I've found this CBVCT in internet

Previous HIV tests:

HIV test in the past? Yes No Don't know Date of last test: _____
Month Year

HIV test in the last 12 months in this CBVCT facility? Yes No Don't know Result of last test: Positive
 Negative
 Don't know

Risk behaviour/factors:

Sex in the last 12 months with: men women women and men I haven't had sex Don't know

Condom use in the last sexual relation with penetration? Yes No Don't know

Exchange of sex for drugs or money in the last 12 months? Yes No Don't know

STI diagnosed in the last 12 months? Yes No Don't know

Ever in jail? Yes No Don't know

Unprotected sex with penetration in the last 12 months with:
 Sex workers: Yes No Don't know
 IDU: Yes No Don't know
 Known HIV positive partner: Yes No Don't know
 MSM: Yes No Don't know

Intravenous drug use? Yes No Don't know Date of last time: _____
Month Year

Share of materials of injection in the last 12 months, as:
 Syringes or needles? Yes No Don't know
 Spoons, filters, water, ...? Yes No Don't know

Pre-test counselling:

Pre-test/pre-result counselling performed? Yes No Don't know

Screening HIV test:

Date of specimen collection:
Day Month Year

Type of test used: Blood rapid test Oral rapid test Conventional blood test (Elisa)

Screening test result: Reactive Non reactive

Did the client receive the screening HIV test result? Yes No Don't know → Date of receiving screening test result:
Day Month Year

Post-test counselling:

Post-test HIV counselling performed? Yes No Don't know

Confirmatory HIV test:

Confirmatory test performed? Yes No Don't know → Date of specimen collection:
Day Month Year

Confirmatory HIV test result: Positive Negative Inconclusive

Did the client receive the confirmatory HIV test result? Yes No Don't know → Date of receiving confirmatory test result:
Day Month Year

Access to health system for those HIV positive:

Patient linked to healthcare system? Yes No Don't know → Date of linkage:
Day Month Year

First CD4 count result: → Date of the first CD4 count:
Day Month Year

MODULE B

Syphilis test:

Previous syphilis diagnosis? Yes No Don't know → Date of last syphilis diagnoses:
Day Month Year

Syphilis test performed? Yes No Don't know → Date of specimen collection:
Day Month Year

Type of test used: Rapid test Conventional test

Rapid test result: Reactive Non reactive

Diagnosis test performed? Yes No Don't know → Date of specimen collection:
Day Month Year

Syphilis diagnosis: Active infection Serological scar (old or cured infection) Not known

HCV test:

Previous HCV diagnosis? Yes No Don't know → Date of last HCV diagnoses:
Day Month Year

HCV test performed? Yes No Don't know → Date of specimen collection:
Day Month Year

Type of test used: Rapid oral test Rapid blood test Conventional test

Rapid test result: Reactive Non reactive

HCV RNA test performed? Yes No Don't know → Date of specimen collection:
Day Month Year

HCV diagnosis: Active infection Serological scar (old or cured infection) Not known

Hepatitis A and B vaccination:

Vaccination for Hepatitis A (with all required doses)? Yes No Don't know

Vaccination for Hepatitis B (with all required doses)? Yes No Don't know

Comments:

Annex 2 CBVCT services/networks that submitted CBVCT M&E data for the first 2015 and 2016, data submission modes and format, COBATEST network.

CBVCT service/network	Country (region)	Reporting period	Data submission mode	Data format
AIDS Hilfe Wien	Austria	1.1. - 31.12.2015	Data file according to specification	Disaggregated
		1.1. - 31.12.2016		
Czech AIDS Help Societ (Prague)	Czech Republic	1.1. - 30.6.2015	Other: email	Aggregated
ISKORAK	Croatia	1.1. - 30.6.2015	Data file according to specification	Disaggregated
		1.1. - 31.12.2016		
AIDS Fondet	Denmark	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
AIDES†	France	1.1. - 31.12.2015	Web based Excel reporting form	Aggregated
		1.1. - 31.12.2016		
Gesundheitsamt Essen	Germany	1.7. - 31.12.2015	Web based Excel reporting form	Aggregated
		1.1. - 31.12.2016		
Fondazione LILA Milano ONLUS	Italy	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Baltic HIV Association	Latvia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Demetra	Lithuania	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
CBVCT centres Poland†	Poland	1.1. - 30.6.2015	Other: email	Aggregated
Checkpoint LX	Portugal	1.1. - 31.12.2015	Web based Excel reporting form	Aggregated
		1.1. - 31.12.2016		
IN-Mouraria	Portugal	1.1. - 31.12.2015	Web based Excel reporting form	Aggregated
		1.1. - 31.12.2016		
MOVE-Se	Portugal	1.1. - 31.12.2015	Web based Excel reporting form	Aggregated
		1.1. - 31.12.2016		
Legebitra	Slovenia	1.1. - 31.12.2015	Data file according to specification	Disaggregated
		1.1. - 31.12.2016		
ADHARA	Spain	1.1. - 30.6.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
AVACOS-H	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
OMSIDA	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Lambda	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
ACCAS	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
IEMAKAIE	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		

CBVCT service/network	Country (region)	Reporting period	Data submission mode	Data format
CAS Gibraltar	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
GADES	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
SILOÉ	Spain	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
ACAVIH	Spain	1.1. - 31.12.2016	COBATEST web-based data entry	Disaggregated
CASDA	Spain	1.1. - 31.12.2016	COBATEST web-based data entry	Disaggregated
CIBE Marítim	Spain	1.1. - 31.12.2016	COBATEST web-based data entry	Disaggregated
Comité Anti-Sida Asturias (CCASIPA)	Spain	1.1. - 31.12.2016	COBATEST web-based data entry	Disaggregated
STOP-SIDA	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
ACASC	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
CIAS	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Gais Positius	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Associació Anti-SIDA de Lleida	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Actuavallès	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Àmbit Prevenció	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
AssexoraTgn	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
ACAS Girona	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
SAPS-Creu Roja	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Creu Roja Tarragona	Spain; Catalonia	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		
Gay-alliance	Ukraine	1.1. - 31.12.2015	COBATEST web-based data entry	Disaggregated
		1.1. - 31.12.2016		

† - CBVCT services network.

Annex 3 List of variables collected by the COBATEST web-based data entry tool, including their variable name, values and format.

	Variables	Variable name	Values	Format
A	Name of the CBVCT	CBVCT name	CBVCT list	string
B	Testing site	Testing site	1 CBVCT office; 2 Outdoors/Van; 3 Sex work venue; 4 Sauna/sex venue; 5 Public venue; 6 Amusement venue;7 Needle exchange venue; 8 Other	numeric
C	City of the CBVCT site	CBVCT City		string
D	Date of visit	Date of visit		dd/mm/yyyy
E	User's Unique identifier (used by the CBVCT service)	COBATEST identifier		string
F	User's Unique identifier (COBATEST)	CBVCT identifier	12 characters	string
G	Gender	Gender	1 male; 2 female; 3 transgender	numeric
H	Date of birth	Date of birth		dd/mm/yyyy
I	Foreign national	Foreign national	1 yes; 2 no; 3 don't know	numeric
J	Country of birth	Country of birth	Country list	string
K	Year of arrival to this country	Year of arrival		dd/mm/yyyy
L	Is the client a	Tourist	1 tourist; 2 resident	numeric
M	Municipality or home town	Municipality		string
N	Reasons for HIV testing:		multiresponse	
O	Risk exposition	Risk exposition	1 yes; 2 no	numeric
P	Unprotected vaginal sex	Unprotected vaginal sex	1 yes; 2 no	numeric
Q	Unprotected anal sex	Unprotected anal sex	1 yes; 2 no	numeric
R	Unprotected oral sex	Unprotected oral sex	1 yes; 2 no	numeric
S	Broken condom	Broken condom	1 yes; 2 no	numeric
T	Unprotected sex with sex worker	Unprotected sex with SW	1 yes; 2 no	numeric
U	My partner has tested positive recently	partner tested positive	1 yes; 2 no	numeric
V	Epidose of sharing injection material	sharing injection material	1 yes; 2 no	numeric
W	Other risk exposition	Other risk exposition	1 yes; 2 no	numeric
X	Which other risk exposition	Which other risk exposition		string
Y	For control/screening	For control/screening	1 yes; 2 no	numeric
Z	My partner asked to me	My partner asked	1 yes; 2 no	numeric
AA	Before dropping using condom with my partner	Before dropping condom	1 yes; 2 no	numeric
AB	I wish to have a baby	Before having a baby	1 yes; 2 no	numeric
AC	Prenatal screening: before delivery	Prenatal screening	1 yes; 2 no	numeric
AD	Regular control	Regular control	1 yes; 2 no	numeric
AE	Only to know my health status	To know health status	1 yes; 2 no	numeric
AF	Other control/srceening reason	Other control/srceening	1 yes; 2 no	numeric
AG	Which other control/screening reason	Which other control/screening		string
AG	Window period ion the last test	Window period	1 yes; 2 no	numeric

AH	Clinical symptoms	Clinical symptoms	1 yes; 2 no	numeric
AI	Other reason for HIV testing	Other reason test	1 yes; 2 no	numeric
AJ	Which other reason	Which other reason test		string
	Reasons for come to this CBVCT service to be tested		Multiresponse	
AK	I've come here before	I've come before	1 yes; 2 no	numeric
AL	A friend told me about this CBVCT	Friend	1 yes; 2 no	numeric
AM	I've seen this CBVCT in a pamphlet	Pamphlet	1 yes; 2 no	numeric
AN	I've found this CBVCT in internet	Internet	1 yes; 2 no	numeric
AO	Other reason	Other reason CBVCT	1 yes; 2 no	numeric
AP	Wich other reason	Which other reason CBVCT		string
AQ	HIV test in the past	Previous HIV test	1 yes; 2 no; 3 don't know	numeric
AR	Date of last test	Date of last test		dd/mm/yyyy
AS	Result of the last test	Result of last test	1 positive; 2 negative; 3 don't know	numeric
AT	HIV test in the last 12 months in this CBVCT	Test in 12 months in this CBVCT	1 yes; 2 no; 3 don't know	numeric
AU	Sex in the last 12 months with:	Sex with	1 men; 2 women; 3 men and women; 4 I haven't had sex; 5 don't know	numeric
AV	Condom use in the last sexual realtion with penetration	Condom use	1 yes; 2 no; 3 don't know	numeric
AW	Exchange of sex for drugs or money in the last 12 months	Sex worker	1 yes; 2 no; 3 don't know	numeric
AX	STI idiagnosed in the last 12 months	STI	1 yes; 2 no; 3 don't know	numeric
AY	Ever in jail	Jail	1 yes; 2 no; 3 don't know	numeric
AZ	Unprotected sex with penetration in the last 12 months with sex workers	Unprotected sex with SW	1 yes; 2 no; 3 don't know	numeric
BA	Unprotected sex with penetration int the last 12 months with IDU	Unprotected sex with IDU	1 yes; 2 no; 3 don't know	numeric
BB	Unprotected sex with penetration in the last 12 months with known HIV positive	Unprotected sex with HIV positive	1 yes; 2 no; 3 don't know	numeric
BC	Unprotected sex with penetration in the last 12 months with MSM	Unprotected sex with MSM	1 yes; 2 no; 3 don't know	numeric
BD	Intravenous drugs use	Intravenous drug use	1 yes; 2 no; 3 don't know	numeric
BE	Date of last time			mm/yyyy
BF	Share if materials of injection in the last 12 months as syringes or needles?	Syringes or needles	1 yes; 2 no; 3 don't know	numeric
BG	Share of materials of injection in the last 12 months as spoons, filters, water,...?	Spoons filter water	1 yes; 2 no; 3 don't know	numeric
BH	Pre-test/pre-result counselling performed	Pre-test counselling	1 yes; 2 no; 3 don't know	numeric
BI	Date of specimen collection	Date of specimen collection		dd/mm/yyyy
BJ	Type of test used	Test used	1 blood rapid test; 2 oral rapid test; 3 conventional test	numeric
BK	Screening test result	Screening test result	1 reactive; 2 non reactive	numeric
BL	Did the client receive the screening HIV test result	Test result received	1 yes; 2 no; 3 don't know	numeric
BM	Date of receiving screening test result	Date test result		dd/mm/yyyy
BN	Post-test counselling performed	Post-test counselling	1 yes; 2 no; 3 don't know	numeric
BO	Confirmatory test performed	Confirmatory HIV test	1 yes; 2 no; 3 don't know	numeric

BP	Date of specimen collection	Date confirmatory HIV test		dd/mm/yyyy
BQ	Confirmatory HIV test result	Confirmatory HIV test result	1 positive; 2 negative; 3 inconclusive	numeric
BR	Did the client receive the confirmatory HIV test result	Confirmatory HIV test result received	1 yes; 2 no; 3 don't know	numeric
BS	Date of receiving confirmatory test result	Confirmatory HIV test result received date		
BT	Patient linked to healthcare system	Linkage to healthcare	1 yes; 2 no; 3 don't know	numeric
BU	Date of linkage	Date of linkage		dd/mm/yyyy
BV	First CD4 count result	CD4 count	4 digits	numeric
BW	Date of the first CD4 count	Date CD4 count		dd/mm/yyyy
BX	Previous syphilis diagnosis	Previous syphilis	1 yes; 2 no; 3 don't know	numeric
BY	Date of last syphilis diagnosis	Date last syphilis		dd/mm/yyyy
BZ	Syphilis test performed	Syphilis test	1 yes; 2 no; 3 don't know	numeric
CA	Date of specimen collection	Date syphilis test		dd/mm/yyyy
CC	Type of test used	Type Syphilis test	1 rapid test; 2 conventional test	numeric
	Rapid test result	syphilis rapid test result	1 reactive; 2 non reactive	numeric
CD	Diagnosis test performed	syphilis confirmation	1 yes; 2 no; 3 don't know	numeric
CE	Date of specimen collection	date syphilis confirmation		dd/mm/yyyy
CF	syphilis diagnosis	syphilis diagnosis	1 Active infection; 2 serological scar; 3 not known	numeric
CG	Previous HCV diagnosis	Previous HCV	1 yes; 2 no; 3 don't know	numeric
CH	Date of last HCV diagnosis	Date previous HCV		dd/mm/yyyy
CI	HCV test performed	HCV test	1 yes; 2 no; 3 don't know	numeric
CJ	Date of specimen collection	Date HCV test		dd/mm/yyyy
CK	Type of test used	Type HCV test	1 Rapid oral test; 2 Rapid blood test; 3 Conventional test	numeric
CL	Rapid test result	HCV rapid test result	1 reactive; 2 non reactive	numeric
CM	HCV RNA test performed	HCV confirmation	1 yes; 2 no; 3 don't know	numeric
CN	Date of specimen collection	Date HCV confirmation		dd/mm/yyyy
CO	HCV diagnosis	HCV diagnosis	1 Active infection; 2 serological scar; 3 not known	numeric
CP	Vaccination for Hepatitis A (with all required doses)	HepA vaccination	1 yes; 2 no; 3 don't know	numeric
CQ	Vaccination for Hepatitis B (with all required doses)	HepB vaccination	1 yes; 2 no; 3 don't know	numeric
CR	Comments	Comments		string

Annex 4 List of disaggregated variables submit by members of the COBATEST network that use their own data entry system, including variable name, values and format.

	Data collected for M&E CBVCTs	Variable name	Values	Format
1A	Clients' unique identifier	Id		String
2B	Gender	gender	1male, 2 female, 3 transgender	Number
3C	Age in years	AgeInYears	2 digits	Number
4D	Date of birth	DateOfBirth	dd/mm/yyyy	Date
5E	Age group	AgeGroup	1<25years old, 2 25+years old	Number
6F	Key population of higher risk	Keypopulation	1 MSM, 2SW, 3PWID, 4 migrants, 5 other, 6 does not want to tell, 7 not asked	Number
7G	Date of "requesting the test" visit	DateOfVisit	dd/mm/yyyy	Date
8H	Ever tested before	EverTested	1 yes, 2 no, 3 does not know, 4 does not want to tell, 5 not asked	Number
9I	Tested previously - last time during 12 months preceding the "requesting the test" visit (last year)	TestedLastYear	1 yes, 2 no, 3 does not know, 4 does not want to tell, 5 not asked	Number
10J	Tested previously - last time during 12 months preceding the "requesting the test" visit at the same CBVCT facility	TestedLastYearSame CBVCT	1 yes, 2 no, 3 does not know, 4 does not want to tell, 5 not asked	Number
11K	Per-test discussion or pre-test counselling	PreTestCounselling	1 yes, 2 no	Number
12L	Screening HIV test performed, e.g. rapid HIV test or ELISA test	ScreeningHIVTest	1 yes, 2 no	Number
13M	Screening HIV test result	ScreeningTestResult	1 yes, 2 no	Number
14N	Date of receiving the screening HIV test result	DateScreeningTestResult	dd/mm/yyyy	Date
15O	Client receiving the screening HIV test result	ScreeningTestresultReceived	1 yes, 2 no	Number
16P	HIV screening test post-result counselling	ScreeningpostTestsCounselling	1 yes, 2 no	Number
17Q	Confirmatory HIV test performed	ConfirmatoryHIVTest	1 yes, 2 no	Number
18R	Confirmatory HIV test result	ConfirmatoryHIVTestResult	1 yes, 2 no	Number
19S	Date of receiving the confirmatory HIV test result	DateConfirmatoryHIVTestResult	dd/mm/yyyy	Date
20T	Post-test HIV counselling	ConfirmatoryPostTestCounselling	1 yes, 2 no, 999 missing	Number
21U	Client received the confirmatory test result	ConfirmatoryTetsResultReceived	1 yes, 2 no, 999 missing	Number
22V	Linkage into health care system	LinkageToHealthCare	1 yes, 2 no, 999 missing	Number
23W	Date of entry into health care	DateOfLinkage	dd/mm/yyyy	Date
24X	CD4 count at entry into health care (count)	CD4Count	4 digits, 9999 mising	Number
25Y	Date of CD4 count at entry into health care	DateCD4Count	dd/mm/yyyy	Date

Annex 5 List of indicators (aggregated data) submitted by some of the members of the COBATEST network.

- CBVCT 1: Number of clients tested for HIV with a screening test
- CBVCT 2: Proportion of clients who reported to have been previously tested for HIV
- CBVCT 3: Proportion of clients who reported to have been tested for HIV during preceding 12 months
- CBVCT 4: Proportion of clients who reported to have been tested for HIV at the same CBVCT facility during preceding 12 months
- CBVCT 5: Proportion of clients with reactive screening HIV test result
- CBVCT 6: Proportion of clients tested for HIV with a screening test who received the results
- CBVCT 7: Proportion of clients with reactive screening HIV test result who received post-result counselling
- CBVCT 8: Proportion of clients with reactive screening HIV test result who were tested with confirmatory HIV test
- CBVCT 9: Proportion of clients with positive confirmatory HIV test result
- CBVCT 10: Proportion of clients with positive confirmatory HIV test result who received the conclusive confirmatory HIV test result at CBVCT facility
- CBVCT 11: Proportion of clients with positive confirmatory HIV test result who received post-result counselling at CBVCT facility
- CBVCT 12: Proportion of clients who received a pre-test discussion or pre-test counselling or pre-result counselling and were tested for HIV with a screening test
- CBVCT 13: Proportion of clients with non-reactive screening HIV test result who received post-result counselling
- CBVCT 14: Proportion of clients with negative confirmatory HIV test result who received the conclusive confirmatory HIV test result at CBVCT facility
- CBVCT 15: Cost per client tested
- CBVCT 16: Cost per HIV diagnosis
- CBVCT 17: Proportion of clients who tested HIV positive at CBVCT sites who were linked to health care
- CBVCT 18: Proportion of clients who tested HIV positive at CBVCT sites who were diagnosed late

Annex 6 Assessment of data quality by completeness and transcription according the type of method used to submit data to the COBATEST network.

	COBATEST WEB-BASED DATA ENTRY	DESAGGREGATED DATA	AGGREGATED DATA
TRANSCRIPTION VALIDITY			
Definition	The percentage of data entries that pass the data accuracy rules.	The percentage of data entries that pass the data accuracy rules.	The percentage of data entries that pass the data accuracy rules.
Reference	Database, metadata or documentation rules as to allowable types (string, integer, data, etc.)	Database, metadata or documentation rules as to allowable types (string, integer, data, etc.)	Numbers type correctly into the excel
Measure	Count of the invalid items by variable	Count of the invalid items	Count of the invalid items
Unit of Measure	Percentage of data items deemed Valid or Invalid Rate	Percentage of data items deemed Valid or Invalid Rate	Percentage of data items deemed Valid or Invalid Rate
COMPLETENESS			
Definition	The proportion of stored data against the potential of "100% complete"	The proportion of stored data against the potential of "100% complete"	The proportion of stored data against the potential of "100% complete"
Reference	It represents the complete list of eligible values and not just a fraction of the list.	It represents the complete list of eligible values and not just a fraction of the list.	It represents the complete list of eligible values and not just a fraction of the list.
Measure	A measure of the absence of blank (null or empty string) values or the presence of non-blank values.	A measure of the absence of blank (null or empty string) values or the presence of non-blank values.	A measure of the absence of blank (null or empty string) values or the presence of non-blank values.
cope	0-100% of critical data to be measured in the database Percentage % of annual unit reports that are not null or empty string $\frac{\text{Total \# of zero /missing values for the reporting year by variable}}{\text{Total \# of expected completed values for the reporting year by variable}}$	0-100% of critical data to be measured in the database Percentage % of annual unit reports that are not null or empty string $\frac{\text{Total \# of zero /missing values for the reporting year by variable}}{\text{Total \# of expected completed values for the reporting year by variable}}$	0-100% of critical data to be measured in the database Percentage % of annual unit reports that are not null or empty string $\frac{\text{Total \# of zero /missing values for the reporting year by variable}}{\text{Total \# of expected completed values for the reporting year by variable}}$
Unit of Measure	Percentage and ratio	Percentage and ratio	Percentage and ratio

Annex 7 Assessment of consistency according the type of method used to submit data to the COBATEST network.

	COBATEST WEB-BASED DATA ENTRY		DESAGGREGATED DATA	
CONSISTENCY				
Definition	Internal consistency between indicators. The absence of difference, when comparing two or more representations of a thing against a definition.		Internal consistency between indicators. The absence of difference, when comparing two or more representations of a thing against a definition.	
Reference	Variable measured against itself or its other variable counterpart in the same database.		Variable measured against itself or its other variable counterpart in the same database.	
Measure	Analysis of pattern and/or value frequency.		Analysis of pattern and/or value frequency.	
Scope	Assessment of things across multiple data sets and/or assessment of values or formats across data items, records, data sets and databases.		Assessment of things across multiple data sets and/or assessment of values or formats across data items, records, data sets and databases.	
Unit of Measure	Percentage.		Percentage.	
Selected variables	Queries	weights	Queries	weights
	1. AQ – AR – AS – AT If AQ ≠1, then AR, AS and AT should be missing value	8.6	1. 3C - 4D - 5E - 7G 3C should be equal to the difference between 7G and 4D.	11.11
	If AR=missing, then AS also should be missing (and conversely)	8.6	If 3C <25, then 5E = 1; if 3C >25, then 5E = 2	11.11
	Si AT=1, then AR should be < 1 year and AQ should be 1	10	2. 9I - 10J If 10J =1, then 9I=1	11.11
	2. BD – BE – BF – BG IF BD ≠1, then BE, BF and BG should be missings	8.6	3. 13M - 14N - 15O If 13M is different to 1 or 2, then 14N and 15O should be missing	11.11
	3. BK – BL – BM Si BK≠1 llavors Bl i BM haurien de ser missing	6.75	If 14N ≠ missing , then 15O = 1	11.11
	If BK=1 and BL≠1, then BL should be missing	6.75	4. 17Q - 18R - 19S If 17Q ≠1 , then 18R and 19S should be missing	11.11
	4. BO – BP – BQ IF BO≠1, then BP and BQ should be missing	10	If 17Q=1 and 21U≠1, then 19S should be missing	11.11
	5. BO - BR- BS If BO≠1, then BR and BS should be missing	8.6	5. 13M - 22V - 23W - 24X - 25Y If 13M ≠1, then 22V, 23W, 24X and 25Y should be missing.	11.11
	If BO=1 and BR≠1, then BS should be missing	8.6	If 13M = 1 and 22V ≠1, then 23W, 24X and 25Y should be missing.	11.11
6. BK - BT – BU – BV If BK≠1, then BT, BU and BV should be missing	10			
If BT≠1, then BU and BV should be missing				
7. N- (O-P-Q_R-S-T-V-W) If N≠1, then O-P-Q_R-S-T-V-W haurien should be missing	6.75			
8. X- (Y-Z-AA-AB-AC-AD-AE-AF) If X≠1, then Y-Z-AA-AB-AC-AD-AE-AF should be missing	6.75			

Annex 8 Weights assigned to the COBATEST variables and basic variables likely to be included in the core set of variables to monitor HIV testing at European level to build an index according with variable level of importance for transcription and completeness.

variable	Weights assigned to the each COBATEST variables	Core set of variables to monitor HIV testing at European level
CBVCT name ^a	3	3
CBVCT City ^a	3	3
Testing site	3	3
Date of visit	3	3
Identifier (CBVCT identifier or COABTEST) ^a	3	8
Gender ^a	3	8
Date of birth ^a	3	8
Foreign national ^a	3	8
Country of birth ^a	3	8
Year of arrival	1,8	
Tourist	1,8	
I. Risk exposition^b	3,4	
Unprotected vaginal sex		
Unprotected anal sex		
Unprotected oral sex		
Broken condom		
Unprotected sex with SW		
partner tested positive		
sharing injection material		
Other risk exposition		
Which other risk exposition		
II. For control screening^b		
My partner asked		
Before dropping condom		
Before having a baby		
Prenatal screening		
Regular control		
To know health status		
Other control srceening		
Which other control screening		
III. Window period^b		
IV. Clinical symptoms^b		
V. Other reason test^b		
I. Which other reason test^c		
I ve come before		
Friend		
Pamphlet		
Internet		
Other reason CBVCT		
Which other reason CBVCT		
Previous HIV test	3	
Date of last test	3	
Result of last test	3	
Test in 12 months in this CBVCT	1,8	
Sex in the last 12 month with ^a	3	8
Condom use in the last sexual relation with penetration	1,8	
Sex worker ^a	3	8
STI in thelast 12 months	1,8	
Ever in jail	1,8	
Unprotected sex with sex worker	1,8	
Unprotected sex with PWID	1,8	
Unprotected sex with a positive HIV	1,8	
Unprotected sex with MSM ^a	1,8	
Intravenous drug use ^a	3	8
Date of last time	0,8	

Syringes or needles	0,8	
Spoons filters water	0,8	
Pre test counselling	0,8	
Date of specimen collection	1,8	
Test used	0,8	
Screening test result ^a	4	8
Test result received	1,8	
Date test result ^a	3	8
Post test counselling	0,8	
Confirmatory HIV test	3	
Date confirmatory HIV test	3	
Confirmatory HIV test result ^a	3	8
Confirmatory HIV test result received	0,8	
Date Confirmatory HIV test result received	0,8	
Linkage to healthcare	3	
Date of linkage	3	
CD4 count	0,8	
Date CD4 count	0,8	
Total Index	100	100

Annex 9 Weights assigned to the COBATEST variables and the ECDC core variables to build an index according with variable level of importance for consistency.

	Data collected for M&E CBVCTs	Variable name	Weights assigned to the variable	Weights assigned to the each Core set of variables at European level
1A	Clients' unique identifier	Id	5	10,5
2B	Gender	gender	5	10,5
3C	Age in years	AgeInYears	3	5,33
4D	Date of birth	DateOfBirth	5	10,5
5E	Age group	AgeGroup	3	5,33
6F	Key population of higher risk	Keypopulation	5	10,5
7G	Date of "requesting the test" visit	DateOfVisit	5	5,33
8H	Ever tested before	EverTested	5	
9I	Tested previously - last time during 12 months preceding the "requesting the test" visit (last year)	TestedLastYear	5	
10J	Tested previously - last time during 12 months preceding the "requesting the test" visit at the same CBVCT facility	TestedLastYearSame CBVCT	3	
11K	Per-test discussion or pre-test counselling	PreTestCounselling	2	
12L	Screening HIV test performed, e.g. rapid HIV test or ELISA test	ScreeningHIVTest	5	10,5
13M	Screening HIV test result	ScreeningTestResult	5	10,5
14N	Date of receiving the screening HIV test result	DateScreeningTestResult	5	10,5
15O	Client receiving the screening HIV test result	ScreeningTestresultReceived	3	
16P	HIV screening test post-result counselling	ScreeningpostTestsCounselling	3	
17Q	Confirmatory HIV test performed	ConfirmatoryHIVTest	5	
18R	Confirmatory HIV test result	ConfirmatoryHIVTestResult	5	10,5
19S	Date of receiving the confirmatory HIV test result	DateConfirmatoryHIVTestResult	5	
20T	Post-test HIV counselling	ConfirmatoryPostTestCounselling	2	
21U	Client received the confirmatory test result	ConfirmatoryTetsResultReceived	2	
22V	Linkage into health care system	LinkageToHealthCare	5	
23W	Date of entry into health care	DateOfLinkage	5	
24X	CD4 count at entry into health care (count)	CD4Count	2	
25Y	Date of CD4 count at entry into health care	DateCD4Count	2	
Total Index			100	99,99

Annex 10 Completeness, transcription and consistency among CBVCT services using the data entry tool, by selected core variables for the COBATEST network and for the ECDC, 2015-2016.

	Completeness 2015		Completeness 2016		Transcription 2015		Transcription 2016		Consistency 2016	
	Total	Core set of variables at European level	Total	Core set of variables at European level	Total	Core set of variables at European level	Total	Core set of variables at European level	Total	Core set of variables at European level
1	87.4	99.8	97.5	99.6	99.6	99.6	99.2	99.0	93.0	92.9
2	89.8	100	98.3	99.9	96.3	99.2	96.5	99.7	93.8	94.3
3	90.7	99.0	88.6	97.2	97.5	99.3	97.0	99.4	94.4	95.4
4			95.3	98.7			97.4	98.2		93.8
5	92.0	96.1	94.6	99.6	96.6	99.6	96.6	99.6	94.3	94.4
6	86.9	95.0	84.6	91.0	96.0	98.5	96.6	98.4	90.0	88.8
7	84.4	92.5	77.1	93.8	91.5	90.2	93.9	90.1	92.6	93.4
8			97.2	100.0			98.8	100		96.8
9	85.6	99.9	85.6	99.7	97.0	99.8	97.0	99.6	94.2	93.9
10	93.1	99.2	93.6	97.0	96.3	98.8	95.4	98.7	93.3	94.5
11	95.2	99.2	95.0	99.5	97.9	99.4	97.1	99.3	93.2	93.7
12	90.6	99.5	96.2	99.9	95.9	98.3	95.7	98.6	99.8	99.8
13	94.9	99.8	93.1	99.9	99.6	99.3	99.6	99.4	93.3	93.7
14	97.7	99.6	89.5	98.5	95.2	96.8	95.6	96.9	93.4	93.7
15	99.8	100.0	98.0	99.7	94.5	94.6	97.0	94.8	92.8	92.9
16	90.7	95.3	99.3	100	94.5	93.8	91.9	92.1	94.9	95.5
17	99.3	100	97.8	100	92.4	93.2	94.8	99.2	93.3	94.5
18			99.4	100			98.9	98.4		92.3
19	97.7	99.9	92.7	99.8	92.7	95.2	91.8	94.2	93.0	93.0
20			99.2	99.6			91.9	96.3		95.1
21	96.9	97.8	96.9	98.1	97.4	99.3	100	100	91.7	92.2
22	99.4	100	99.6	99.9	95.4	91.0	93.9	91.5	93.9	94.5
23	96.4	96.9	96.6	99.5	96.4	99.9	88.8	97.7	96.7	97.5
24	92.5	96.9	91.9	97.0	94.5	96.5	95.8	99.9	92.4	92.6
25	95.2	97.2	99.0	100	96.1	99.8	96.3	99.3	96.0	97.7
26	90.6	93.7	92.1	96.0	93.3	90.2	89.6	88.5	94.2	94.5
27	94.8	96.3	94.1	96.4	93.8	91.3	92.1	93.9	97.3	98.8
28	88.5	97.2	96.6	99.8	96.5	99.3	96.2	99.6	99.5	99.2
29	99.6	100	98.4	99.2	99.2	98.7	99.3	98.3	90.2	88.5
30	81.6	93.8	82.4	96.7	96.5	99.8	96.4	99.9	93.9	93.7
TOTAL	89.6	97.4	90.3	96.9	96.0	98.3	95.8	98.3	93.4	93.4

Annex 11 Completeness, transcription and consistency among CBVCT services sending disaggregated data, by selected core variables for the COBATEST network and for the ECDC, 2015-2016.

	Completeness 2015		Completeness 2016		Transcription 2015		Transcription 2016		Consistency	
	Total	Core set of variables at European level	Total	Core set of variables at European level	Total	Core set of variables at European level	Total	Core set of variables at European level	2015	2016
1	89.45	83.38	92.26	95.91	96.730	99.518	99.500	99.593	99.70	99.08
2	70.59	77.55	62.96	66.33	99.770	99.535	92.188	83.376	100.00	100.00
3	87.50	93.92	83.93	100.00	93.961	87.877	99.860	99.810	99.70	100.00
Total	88.11	82.69	89.02	94.21	96.341	98.702	99.074	98.387	99.09	98.43

Annex 12 Functional areas of a data management and reporting system among the CBVCT services that use the data entry tool, COBATEST network 2017.

M&E capabilities, roles and responsibilities				
	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
There is a documented organizational structure/chart that clearly identifies positions that have data management responsibilities at CBVCT service	12 (50)	4 (16.7)	5 (20.8)	3 (12.5)
There is a training plan which includes staff involved in data collection and reporting process	11 (45.8)	7 (29.2)	2 (8.3)	4 (16.7)
All staff including volunteers received training on the data management processes and tools	13 (54.2)	7 (29.2)	2 (8.3)	2 (8.3)
There is a senior staff member (e.g., the Program Manager) responsible for reviewing the data sent to the COBATEST network	11 (45.8)	5 (20.8)	5 (20.8)	3 (12.5)
There are designated staff responsible for reviewing the quality of data (i.e., accuracy, completeness and timeliness)	13 (54.2)	5 (20.8)	4 (16.7)	2 (8.3)
There are designated staff responsible for reviewing aggregated numbers or the digitalization of data prior to submission to the COBATEST network	10 (41.7)	6 (25)	4 (16.7)	4 (16.7)
There is responsibility for recording the delivery of services on source documents clearly assigned to specific staff member/s at the CBVCT service	21 (87.5)	1 (4.2)	1 (4.2)	1 (4.2)
Indicator definitions and reporting guidelines				
CBVCT service follow any data collection guidelines	20 (83.3)	3 (12.5)	1 (4.2)	0 (0)
There is a main document which describes the way to built each variable or indicator measured by the CBVCT service	13 (54.2)	6 (25)	4 (16.7)	1 (4.2)
The CBVCT service use the COBATEST indicator's guidelines to built the indicators measured	16 (66.7)	5 (20.8)	2 (8.3)	1 (4.2)
The CBVCT service share the definition of the indicator(s) measured by the CBVCT service with all the people involved in data collection and manipulation at the service	14 (58.3)	8 (33.3)	1 (4.2)	1 (4.2)
The manager has read the COBATEST indicator's guidelines	16 (66.7)	5 (20.8)	2 (8.3)	1 (4.2)
Data collection and reporting tools and forms				

The CBVCT service provides standard reporting forms/tools to be used by all the people working with data at the CBVCT service	18 (75)	3 (12.5)	1 (4.2)	2 (8.3)
There are clear instructions on how to complete the data collection and reporting forms/tools	19 (79.2)	4 (16.7)	0 (0)	1 (4.2)
Members of the CBVCT service use the documents which describe indicators. data collection and reporting forms/tools	15 (62.5)	4 (16.7)	2 (8.3)	3 (12.5)
All the main documents and reporting forms are relevant for building the CBVCT service's indicator(s) available for auditing purposes	12 (50)	8 (33.3)	1 (4.2)	3 (12.5)
Data management processes				
There is at your CBVCT service a written procedure to address incomplete, inaccurate, and/or missing reports	1 (4.2)	5 (20.8)	15 (62.5)	3 (12.5)
There are quality controls performed after the paper data is entered on the computer? (e.g., double entry, post data entry verification, etc).	9 (37.5)	7 (29.2)	7 (29.2)	1 (4.2)
If data discrepancies are identified, is there any standard procedure to document and resolve these inconsistencies	7 (29.2)	7 (29.2)	7 (29.2)	3 (12.5)
Relevant personal client data are maintained according to national or international confidentiality guidelines.	21 (87.5)	1 (4.2)	1 (4.2)	1 (4.2)
There is a process to ensure proper follow up of people that have been linked to care	10 (41.7)	6 (25)	4 (16.7)	4 (16.7)
There is a process to take into account double counting of people coming to your CBCT service more than once during the reporting period	10 (41.7)	5 (20.8)	5 (20.8)	4 (16.7)
Links with the national reporting system				
There are data from your CBVCT service reported to the national information systems or national authority	11 (45.8)	1 (4.2)	6 (25)	6 (25)
National authority showed interest in integrate the data collected by the CBVCT service into the national datasets	9 (37.5)	3 (12.5)	9 (37.5)	3 (12.5)
There is any proposed initiative to integrate your CBVCT service data into the regional or national datasets	6 (25)	5 (20.8)	6 (25)	7 (29.2)
Data use				
The CBVCT service's project manager and data manager have access to collected data	16 (66.7)	1 (4.2)	2 (8.3)	5 (20.8)

The CBVCT service analyses the collected data in an independent manner from the COBATEST network for internal purposes	14 (58.3)	6 (25)	3 (12.5)	1 (4.2)
The CBVCT service uses the information generated through the COBATEST network tools? e.i. indicators. variables. export data. etc.	13 (54.2)	7 (29.2)	2 (8.3)	2 (8.3)
Program/service staff make decisions based on the collected data	14 (58.3)	5 (20.8)	1 (4.2)	4 (16.7)

Annex 13 Functional areas of a data management and reporting system among the CBVCT services that sent disaggregated data to the COBATEST network, 2017.

M&E capabilities, roles and responsibilities				
	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
There is a documented organizational structure/chart that clearly identifies positions that have data management responsibilities at CBVCT service	0 (0)	2 (100)	0 (0)	0 (0)
There is a training plan which includes staff involved in data collection and reporting process	0 (0)	2 (100)	0 (0)	0 (0)
All staff including volunteers received training on the data management processes and tools	0 (0)	2 (100)	0 (0)	0 (0)
There is a senior staff member (e.g.. the Program Manager) responsible for reviewing the data sent to the COBATEST network	0 (0)	1 (50)	1 (50)	0 (0)
There are designated staff responsible for reviewing the quality of data (i.e.. accuracy, completeness and timeliness)	1 (50)	1 (50)	0 (0)	0 (0)
There are designated staff responsible for reviewing aggregated numbers or the digitalization of data prior to submission to the COBATEST network	0 (0)	1 (50)	1 (50)	0 (0)
There is responsibility for recording the delivery of services on source documents clearly assigned to specific staff member/s at the CBVCT service	1 (50)	1 (50)	0 (0)	0 (0)
Indicator definitions and reporting guidelines				
CBVCT service follow any data collection guidelines	1 (50)	1 (50)	0 (0)	0 (0)
There is a main document which describes the way to built each variable or indicator measured by the CBVCT service	0 (0)	1 (50)	1 (50)	0 (0)
The CBVCT service use the COBATEST indicator's guidelines to built the indicators measured	0 (0)	2 (100)	0 (0)	0 (0)
The CBVCT service share the definition of the indicator(s) measured by the CBVCT service with all the people involved in data collection and manipulation at the service	1 (50)	1 (50)	0 (0)	0 (0)
The manager has read the COBATEST indicator's guidelines	2 (100)	0 (0)	0 (0)	1 (0)
Data collection and reporting tools and forms				

The CBVCT service provides standard reporting forms/tools to be used by all the people working with data at the CBVCT service	1 (50)	1 (50)	0 (0)	0 (0)
There are clear instructions on how to complete the data collection and reporting forms/tools	2 (100)	0 (0)	0 (0)	0 (0)
Members of the CBVCT service use the documents which describe indicators. data collection and reporting forms/tools	0 (0)	2 (100)	0 (0)	0 (0)
All the main documents and reporting forms are relevant for building the CBVCT service's indicator(s) available for auditing purposes	0 (0)	1 (50)	1 (50)	0 (0)
Data management processes				
There is at your CBVCT service a written procedure to address incomplete. inaccurate. and/or missing reports	0 (0)	0 (0)	2 (100)	0 (0)
There are quality controls performed after the paper data is entered on the computer? (e.g.. double entry. post data entry verification. etc).	1 (50)	0 (0)	1 (50)	0 (0)
If data discrepancies are identified. is there any standard procedure to document and resolve these inconsistencies	0 (0)	1 (50)	1 (50)	0 (0)
Relevant personal client data are maintained according to national or international confidentiality guidelines.	2 (100)	0 (0)	0 (0)	0 (0)
There is a process to ensure proper follow up of people that have been linked to care	0 (0)	1 (50)	1 (50)	0 (0)
There is a process to take into account double counting of people coming to your CBCT service more than once during the reporting period	0 (0)	2 (100)	0 (0)	0 (0)
Links with the national reporting system				
There are data from your CBVCT service reported to the national information systems or national authority	2 (100)	0 (0)	0 (0)	0 (0)
National authority showed interest in integrate the data collected by the CBVCT service into the national datasets	1 (50)	0 (0)	1 (50)	5 (250)
There is any proposed initiative to integrate your CBVTC service data into the regional or national datasets	1 (50)	0 (0)	1 (50)	10 (500)
Data use				
The CBVCT service's project manager and data manager have access to collected data	2 (100)	0 (0)	0 (0)	0 (0)
The CBVCT service analyses the collected data in an independent manner from the COBATEST network for internal purposes	1 (50)	1 (50)	0 (0)	0 (0)
The CBVCT service uses the information generated thought the COBATEST network tools? e.i. indicators. variables. export data. etc.	0 (0)	1 (50)	1 (50)	0 (0)

Program/service staff make decisions based on the collected data

0 (0)

2 (100)

0 (0)

0 (0)

Annex 14 Functional areas of a data management and reporting system among the CBVCT services that sent aggregated data to the COBATEST network, 2017.

M&E capabilities, roles and responsibilities				
	Yes, completely n (%)	Partly n (%)	No, not at all n (%)	Not Applicable n (%)
There is a documented organizational structure/chart that clearly identifies positions that have data management responsibilities at CBVCT service	4 (80)	1 (20)	0 (0)	0 (0)
There is a training plan which includes staff involved in data collection and reporting process	3 (60)	2 (40)	0 (0)	0 (0)
All staff including volunteers received training on the data management processes and tools	4 (80)	1 (20)	0 (0)	0 (0)
There is a senior staff member (e.g., the Program Manager) responsible for reviewing the data sent to the COBATEST network	3 (60)	1 (20)	1 (20)	0 (0)
There are designated staff responsible for reviewing the quality of data (i.e., accuracy, completeness and timeliness)	4 (80)	0 (0)	0 (0)	1 (20)
There are designated staff responsible for reviewing aggregated numbers or the digitalization of data prior to submission to the COBATEST network	3 (60)	1 (20)	0 (0)	1 (20)
There is responsibility for recording the delivery of services on source documents clearly assigned to specific staff member/s at the CBVCT service	2 (40)	1 (20)	0 (0)	2 (40)
Indicator definitions and reporting guidelines				
CBVCT service follow any data collection guidelines	5 (100)	0 (0)	0 (0)	0 (0)
There is a main document which describes the way to built each variable or indicator measured by the CBVCT service	3 (60)	0 (0)	1 (20)	1 (20)
The CBVCT service use the COBATEST indicator's guidelines to built the indicators measured	1 (20)	3 (60)	0 (0)	1 (20)

The CBVCT service share the definition of the indicator(s) measured by the CBVCT service with all the people involved in data collection and manipulation at the service	1 (20)	2 (40)	0 (0)	2 (40)
The manager has read the COBATEST indicator's guidelines	5 (100)	0 (0)	0 (0)	0 (0)
Data collection and reporting tools and forms				
The CBVCT service provides standard reporting forms/tools to be used by all the people working with data at the CBVCT service	4 (80)	0 (0)	1 (20)	0 (0)
There are clear instructions on how to complete the data collection and reporting forms/tools	5 (100)	0 (0)	0 (0)	0 (0)
Members of the CBVCT service use the documents which describe indicators, data collection and reporting forms/tools	2 (40)	1 (20)	1 (20)	1 (20)
All the main documents and reporting forms are relevant for building the CBVCT service's indicator(s) available for auditing purposes	2 (40)	2 (40)	0 (0)	1 (20)
Data management processes				
There is at your CBVCT service a written procedure to address incomplete, inaccurate, and/or missing reports	1 (20)	0 (0)	3 (60)	1 (20)
There are quality controls performed after the paper data is entered on the computer? (e.g., double entry, post data entry verification, etc).	1 (20)	3 (60)	1 (20)	0 (0)
If data discrepancies are identified, is there any standard procedure to document and resolve these inconsistencies	1 (20)	2 (40)	2 (40)	0 (0)
Relevant personal client data are maintained according to national or international confidentiality guidelines.	5 (100)	0 (0)	0 (0)	0 (0)
There is a process to ensure proper follow up of people that have been linked to care	1 (20)	2 (40)	1 (20)	1 (20)
There is a process to take into account double counting of people coming to your CBCT service more than once during the reporting period	2 (40)	2 (40)	1 (20)	0 (0)
Links with the national reporting system				
There are data from your CBVCT service reported to the national information systems or national authority	3 (60)	0 (0)	2 (40)	0 (0)

National authority showed interest in integrate the data collected by the CBVCT service into the national datasets	2 (40)	0 (0)	1 (20)	2 (40)
There is any proposed initiative to integrate your CBVTC service data into the regional or national datasets	2 (40)	0 (0)	1 (20)	2 (40)
Data use				
The CBVCT service's project manager and data manager have access to collected data	5 (100)	0 (0)	0 (0)	0 (0)
The CBVCT service analyses the collected data in an independent manner from the COBATEST network for internal purposes	3 (60)	2 (40)	0 (0)	0 (0)
The CBVCT service uses the information generated thought the COBATEST network tools? e.i. indicators. variables. export data. etc.	1 (20)	0 (0)	3 (60)	1 (20)
Program/service staff make decisions based on the collected data	1 (20)	3 (60)	0 (0)	1 (20)

Annex 15 Survey to assess six functional areas of a data management and reporting system

1. General information

1.1. **Date** / /

1.2. **CBVCTs name**

1.3. **How your CBVCT service sent data to the COBATEST network**

- [1] By the data application tool
- [2] By sending a minimum of disaggregated data or
- [3] By sending aggregated CBVCT core indicators.
- [4] By other way
- [5] We are not sending data

2. General information about you

2.1. **Date of birth**

| || | | | | | | || || || |

2.2. **What is your employment status in this CBVCT service? Circle only ONE**

- [1] Employee
- [2] Volunteer
- [3] Other. Specify:
- [9] Don't know / don't want to answer

2.3. **What is your position in this CBVCT service? Circle only ONE**

- [1] Director
- [2] Manager
- [3] HIV testing project manager
- [4] Other. Specify:
- [5] Don't know / don't want to answer

2.4. **What is your background training? Circle only ONE**

- [1] Doctor
- [2] Nurse
- [3] Social worker
- [4] Psychologist
- [5] Peer educator
- [6] Other. Specify:
- [7] I do not have any training
- [9] Don't know / don't want to answer

2.5. **How long have you been working at this CBVCT service?**

Years: | || |

Months: | || |

3. General information about the CBVCT service

3.1. **Who is responsible for the management of the CBVCT service?**

- [1] An NGO
- [2] A public body
- [3] A private body
- [4] A public-private body
- [5] A foundation
- [6] Other. please specify

3.2. **How is your CBVCT service funded?**

- [1] Public/governmental funded
- [2] Private – for profit (e.g. pharmaceutical)
- [3] Private - not for profit (e.g. foundation)
- [4] Co-funded public and private

- [5] Other – specify
- 3.3. **How many people in total are working in the CBVCT service (including part-time, full time, temporary staff, etc.)?**
 | || || |
- 3.4. **From those how many are volunteers?**
 | || || |
- 3.5. **In which settings is your CBVCT service programme implemented?** (you may tick more than one)
 [1] NGO setting (specify.....)
 [2] Outdoor setting (e.g. van, street, etc.)
 [3] Venue setting (e.g. gay venue, sauna, disco, bar)
 [4] Health care setting (Clinic, Hospital, Health centre, primary care centre, etc.)
 [5] Others (specify)
- 3.6. **Which target group is reached by your programme?** (you may tick more than one)
 [1] MSM
 [2] Female Sex workers
 [3] Male Sex workers
 [4] IDU
 [5] Male migrants
 [6] Female migrants
 [7] Transsexual/transgender
 [8] Young people
 [9] General population
 [10] Other: specify
 [11] Not specified
 [12] Don't know
- 3.7. **Which HIV tests are used?** (you may tick more than one)
 [1] Conventional test on blood sample
 [2] Rapid test on blood (finger prick)
 [3] Rapid test on oral fluid
 [4] Other: specify
 [5] Don't know
- 3.8. **Where is the confirmation test performed?**
 [1] The confirmation test is performed at the CBVCT service
 [2] A blood sample is extracted and sent to a reference laboratory.
 [3] The client is referred to a reference laboratory or to a Hospital HIV unit.
 [4] We recommend to the client to go to a health care centre.
 [5] Other, specify:
- 3.9. **Is there a referral to specialised clinical setting for treatment and care for HIV+ diagnosed clients?**
 [1] Yes, the clients are referred to a Hospital HIV unit.
 [2] Yes, the clients are referred to their Primary Health Care centre, and there they are referred to the Hospital HIV unit.
 [3] No, the clients are just informed about the Health Care centres existing.
- 3.10. **Is the client accompanied into the Health care centre for treatment and care?**
 [1] Yes, always
 [2] We offer them the possibility
 [3] No.
- 3.11. **Do you perform any kind of follow-up of those HIV+ diagnosed clients who have been referred?**
 [1] Yes, always
 [2] Just if the clients want it.
 [3] No.
- 3.12. **Which kind of unique identifier is being used?**
 [1] We are using the COBATEST identifier
 [2] We are using our own identifier. Please, specify how your own identifier is constructed:

4. M&E capabilities, roles and responsibilities

- 4.1. **Is there a documented organizational structure/chart that clearly identifies positions that have data management responsibilities at your CBVCT service? Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 4.2. **Is there a training plan which includes staff involved in data collection and reporting process?**
Circle only ONE
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 4.3. **All staff including the volunteers that are, have received training on the data management processes and tools? Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 4.4. **A senior staff member (e.g., the Program Manager) is responsible for reviewing the data sent to the COBATEST network. Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 4.5. **There are designated staff responsible for reviewing the quality of data (i.e., accuracy, completeness and timeliness). Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 4.6. **There are designated staff responsible for reviewing aggregated numbers or the digitalization of data prior to submission to the COBATEST network. Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 4.7. **The responsibility for recording the delivery of services on source documents is clearly assigned to specific staff o member/s of the CBVCT service. Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable

5. Indicator definitions and reporting guidelines

- 5.1. **Does your CBVCT service share the definition of the indicator(s) with all the people involved in data collection and manipulation at the CBVCT service? Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 5.2. **There is a document description of the CBVCT service that is related to each variable or indicator measured by the CBVCT service. Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all
- [9] Not Applicable

5.3. **Have you read the COBATEST indicator's guidelines? Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all
- [9] Not Applicable

5.4. **There is a document description of the CBVCT service that is related to each variable or indicator in your CBVCT service different to the COBATEST indicator's guidelines? Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all
- [9] Not Applicable

5.5. **Does your CBVCT service follow the data collection guidelines? Circle only ONE**

- [1] Yes
- [2] No. which one does your service follow
- [3] I don't remember
- [9] Don't know / Don't want to answer

6. Data collection and reporting tools and forms

6.1. **Does your CBVCT service provide standard reporting forms/tools to be used by all the people working with data at the CBVCT service? Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all (**Jump to Question 6.3**)
- [9] Not Applicable

6.2. **Which reporting forms/tools is your service using currently?**

- [1] COBATEST forms and tools
- [2] Form and tools designed by the service
- [3] Form and tools designed by country health authorities
- [4] Other (please describe):
- [9] Don't know / Don't want to answer

6.3. **Are there clear instructions on how to complete the data collection and reporting forms/tools? Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all
- [9] Not Applicable

6.4. **Does the documents describing indicators, data collection and reporting forms/tools to complete the data collection and reporting forms/tools specified by your CBVCT service are consistently used by all members? Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all
- [9] Not Applicable

6.5. **All source documents and reporting forms relevant for measuring the indicator(s) are available for auditing purposes (including dated print-outs in case of computerized system). Circle only ONE**

- [1] Yes. completely
- [2] Partly
- [3] No. not at all

[9] Not Applicable

7. Data management processes

- 7.1. **There is at your CBVCT service a written procedure to address late, incomplete, inaccurate, and/or missing reports; including following-up with sub-reporting levels on data quality issues? Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 7.2. **Are there quality controls in place for when data from paper based forms are entered into a computer (e.g., double entry, post data entry verification, etc). Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 7.3. **If data discrepancies are identified, is there any standard procedure to document and resolve these inconsistencies? Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 7.4. **Relevant personal client data are maintained according to national or international confidentiality guidelines. Circle only ONE**
[1] Yes, completely
[2] Partly
[3] No, not at all
[9] Not Applicable
- 7.5. **Is there a standard procedure to follow up people with reactive tests that do not return for their results? Circle only ONE**
[1] Yes, if yes, please describe
[2] Partly
[3] No, not at all
[9] Not Applicable
- 7.6. **Is there a process to ensure proper registration of people who have transferred in/out (including through referral)? Circle only ONE**
[1] Yes, if yes, please describe
[2] Partly
[3] No, not at all
[9] Not Applicable
- 7.7. **Is there a process to take into account double counting of people who come to the CBVCT service more than once during the reporting period? Circle only ONE**
[1] Yes, if yes, please describe
[2] Partly
[3] No, not at all
[9] Not Applicable

8. Links with the national reporting system.

- 8.1. **Are data from your CBVCT service reported to the national information systems or national authority? Circle only ONE**
[1] Yes
[2] Partly
[3] No, not at all (**Jump to Question 8.6**)
[9] Not Applicable (**Jump to Question 8.6**)

8.2. **Which method does your service use to report collected data to the national information system? Circle only ONE**

[1] Paper filled method

[3] My web service

[4] By email

[5] Other (please describe):

[9] Don't know / Don't want to answer (**Jump to Question 7.1**)

8.3. **Have you CBVCT service received any training from National authority to collect data?**

[1] Yes

[2] Partly

[3] No. not at all

[9] Not Applicable

8.4. **Have you met the national counterpart to set up the data transfer system?**

[1] Yes

[2] Partly

[3] No. not at all

[9] Not Applicable

8.5. **What type of data does your CBVCT service sent to the national information system? Circle as many as applicable.**

[1] Disaggregated data (**Jump to Question 8.8**)

[3] Aggregated data (**Jump to Question 8.8**)

[4] Indicators (**Jump to Question 8.8**)

[5] Other (please describe): (**Jump to Question 8.8**)

[9] Don't know / Don't want to answer (**Jump to Question 8.8**)

8.6. **Have your National authority showed interest in integrate the data collected by your CBVCT services into the national datasets?**

[1] Yes

[2] Partly

[3] No. not at all

[9] Not Applicable

8.7. **There is in your country any proposed initiative to integrate your CBVTC service data into the regional or national datasets.**

[1] Yes

[2] Partly

[3] No. not at all

[9] Not Applicable

8.8. **In your view which method will be the more appropriate for your service to report collected data to the national information system?**

[1] Paper filled method

[3] My web service

[4] By email

[5] Other (please describe):

[9] Don't know / Don't want to answer

9. Data use

9.1. **Do your CBVCT service project manager and data manager have access to collected data? Circle only ONE**

[1] Yes. completely

[2] Partly

[3] No. not at all

[9] Not Applicable

9.2. **Does your service analyse the collected data in an independent manner from the COBATEST network for internal purposes? Circle only ONE**

[1] Yes. completely

[2] Partly

- [3] No. not at all
- [9] Not Applicable
- 9.3. **Does your service use the information generate thought the COBATEST network tools? Circle only ONE**
 - [1] Yes. completely (**Jump to question 9.6**)
 - [2] Partly (**Jump to question 9.6**)
 - [3] No. not at all
 - [9] Not Applicable
- 9.4. **Does your service use other data collection tool a part from the COBATEST one? Circle only ONE**
 - [1] No. we just use the COBATEST data collection form
 - [3] Yes. we use other data entry tool (**Jump to question 9.5**)
 - [2] We are using our own data collection tool
 - [9] Not Applicable
- 9.5. **Why is your service using other data collection tool different from the COBATEST one?**
Circle only ONE
 - [1] Because we need to ask questions not included in the COBATEST data collection form
 - [2] Because we have to use the data collection form asked by the national information system
 - [3] Because we don't like the COBATEST data collection form
 - [4] Other. specify:
 - [9] Not Applicable
- 9.6. **How is your service extracting the data digitized?** you may circle more than one
 - [1] We use the indicators report generated by the COBATEST data entry tool
 - [2] We use the Excel file generated by the COBATEST data entry tool
 - [3] We use our own system
 - [[4] Other. specify:
 - [9] Not Applicable
- 9.7. **Does program/service staff make decisions based on the collected data? Circle only ONE**
 - [1] Yes. completely
 - [2] Partly
 - [3] No. not at all
 - [9] Not Applicable
- 9.8. **How do your service use the data collected at your CBVCTservice?**
 - [1] To follow the CBVCTs daily activities
 - [2] To inform the service's clients
 - [3] To inform member of the CBVCTs
 - [4] To be share with the media
 - [5] To inform policy makers
 - [6] To be included into research projects
 - [9] Don't know / Don't want to answer

10. Definitions:

- 10.1. **How does your service understand or define linkage to care?**

Annex 16 Audit questionnaire for the CBVCT services selected for the audit site.

AUDIT QUESTIONS		
CBVCT service: -		
Data: -		
13 Questions	Answer	Comments
	1. Yes – completely 2. Partly 3. No - not at all 4. N/A	
1.	Are key M&E and data-management staff identified with clearly assigned responsibilities?	
2.	Does the CBVCT service ensure that the methodology for collating the data is clear and that detailed instructions are made available to data processors?	
3.	Have the majority of key M&E and data-management staff received the required training?	
4.	Has the Program/Project clearly documented (in writing) what is reported to who, and how and when reporting is required?	
5.	If using an electronic system. Does your service build formulae into the spreadsheets and clarify which source data will be aggregated and manipulated?	
6.	Are there operational indicator definitions created by the COBATEST network are systematically followed?	

7.	Are there standard data collection and reporting forms that are systematically used?		
8.	Are data recorded with sufficient precision/detail to measure COBATEST indicators?		
9.	Are data maintained in accordance with international or national confidentiality guidelines?		
10.	Are source documents kept and made available in accordance with a written protocol?		
11.	Does clear documentation of collection, aggregation and manipulation steps exist?		
12.	Are data quality challenges identified and are mechanisms in place for addressing them?		
13.	Are there clearly defined and followed procedures to identify and reconcile discrepancies in reports?		
14.	Are there clearly defined and followed procedures to periodically verify source data?		
15.	Does your service carry out routinely and randomly check for transcription errors. If necessary, double-enter data?		
16.	Are data available frequently enough to inform program management decisions?		

17.	Are the data reported the most current practically available?		
18.	Does the data collection and reporting system of the Program/project link to the National Reporting System?		

Annex 17 List of sites audits of functional areas and documentation to request from the external consultant for desk review (if available).

Functional Areas	General Documentation Requested	Check if provided	Comments
Contact Information	Names and contact information for key program/project officials. including key staff responsible for data management activities.		
I – M&E Structures. Roles. and Capabilities	Organizational chart depicting M&E responsibilities.		
	M&E Training Plan. if one exists.		
	Instructions with reporting requirements and deadlines.		
	Description of how service delivery is recorded on source documents. and on other documents such as periodic site reports.		
	Detailed data flow diagram including:		
	a. Collection of data in a client's visit		
	b. Manipulation of data after a visit		
	c. Aggregation of data		
	d. Sending of data to the COABTEST coordinator		
	National M&E Plan. if one exists.		
	Operational definitions of indicators.		
III – Data collection and Reporting Forms and Tools	Guidelines of sending process to the COBATEST network		
	Guidelines of good practices		
	Data-collection form(s) for the indicator(s)		
IV – Data Management Processes	Reporting form(s) for the indicator(s) or for the collected data		
	Instructions for completing the data collection and reporting forms.		
	Written documentation of data management processes including a description of all data-verification. aggregation. and manipulation steps performed at each level of the reporting process.		
V – Links with National Reporting System	Written procedures for addressing specific data quality challenges (e.g. double-counting. “lost to follow-up”). including instructions for the coordinators.		
	Guidelines and schedules for internal routine supervisory audits.		
V – Links with National Reporting System	Documented links between the program/project data reporting system and the relevant national data reporting system. if one exists.		