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TECHNICAL REPORT

Assessment of HIV Quality of Care in Cote d'Ivoire

DECEMBER 2009

This report was prepared by University Research Co., LLC, for review by the United States Agency for International Development (USAID) and was authored by Ya-Shin Lin, Nigel Livesley, David Nicholas, and Jean Nguessan. The USAID Health Care Improvement Project is made possible by the generous support of the American people through USAID.

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ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
ARV	Antiretrovirals
AZT	Zidovudine
CD4	Cluster of differentiation 4
D4T	Stavudine
EFV	Efavirenz
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
HCI	USAID Health Care Improvement Project
HIV	Human Immunodeficiency Virus
ICAP	International Center for AIDS Care and Treatment Programs
IEC	Information, Education and Communication
M	Month
MOH	Ministry of Health and Public Hygiene
ND	No data
NGO	Non-governmental organization
NVP	Nevirapine
PMTCT	Prevention of Mother-to-Child Transmission
PNPEC	National Program for the Care and Treatment of HIV/AIDS (*Programme National de Prise en Charge des Personnes Vivant avec le VIH*)
TB	Tuberculosis
3TC	Lamivudine
URC	University Research Co., LLC
USAID	United States Agency for International Development
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction

With the goal of using results to design a follow-on quality improvement program, we conducted an assessment to identify key strengths and weaknesses in the HIV/AIDS care and treatment services in Cote d'Ivoire. The assessment was conducted by staff from the Ministry of Health and its National HIV Care Program for Persons Living with HIV/AIDS (*Programme National de Prise en Charge Médicale des Personnes Vivants Avec le VIH/SIDA*, PNPEC), key HIV/AIDS implementing partners (EGPAF, ACONDA, CARE, ICAP), and University Research Co., LLC through the USAID Health Care Improvement Project.

Methods

In July 2008, we collected data from interviews with providers or heads of HIV services, as well as cohort data from medical records and registers used for prevention of mother-to-child transmission (PMTCT), voluntary counseling and testing (VCT), antiretroviral therapy (ART) and HIV care services. Historical patient data during a potential 12-month period were abstracted from individual patient medical records for two cohorts of HIV-positive patients in care. The first cohort, made of patients already on ART, was defined as patients who had a documented ART initiation date in their medical records as of June 2007. The second cohort, the "pre-ART" cohort, consisted of patients who had tested HIV-positive, were in HIV care, but who had not initiated ART in the first three months of HIV care. A third cohort was drawn from PMTCT registers and consisted of prenatal care clients who had tested HIV-positive and for whom data might be available for a potential period of 18 months. For all three cohorts, lack of documentation of care performed was interpreted as lack of care provided.

Findings

We reviewed 653 pre-ART records from 30 sites, 800 medical records of ART care from 33 sites, and data for 376 women in PMTCT programs at 26 sites. We conducted interviews with 33 providers, most of whom were the facility's coordinator of HIV/AID care.

Patient information systems and data quality: We found substantial variations in methods of documenting patient care across sites, including forms and registers provided by PNPC and HIV implementing partners, as well as self-designed tools. There was wide variation among sites and cohorts with respect to the existence of medical records and medical record-keeping practices, such as when a new medical record was opened relative to initiation of HIV care. This considerably influenced efficient access to information and had a major impact on the results of the assessment. We found that 38% of ART patients who had no documentation in the medical record of any follow-up visits after the initial consultation actually received some kind of ART services. This finding indicates poor documentation practices in medical records. Information systems for tracking PMTCT patients were particularly poorly organized. Additional challenges to efficient management of patient information included patient confidentiality concerns, form stock-outs, and hardware and software issues for pharmaceutical data.

Workforce: There was also considerable variation among sites with respect to the rational distribution of clinical tasks among the different cadres of health workers. In the pre-ART cohort, physicians were the cadre most often reported to provide HIV counseling. In the ART cohort, non-physician staff were reported to have gathered clinical information and provided counseling in 52% of sites. In 61% of sites, they also conducted simple clinical procedures, such as taking vital signs and weights and drawing blood.

Quality of pre-ART care: Adherence to clinical standards for HIV care (i.e., HIV typing, weight-taking, CD4 count, and clinical staging) was very good during the first clinical visit in at least two-thirds of cases. However, psychosocial standards were not adhered to as well: only 13% of medical records of adult patients documented evidence of any HIV counseling, and only 11% documented partner counseling. After the first visit, retention of patients was poor: only one out of three adult patients who initiated care had evidence of a clinic visit in the second six months after initiation of care. Retention

was slightly higher for children: 44% were seen again between six and 12 months after initiating care. Of those patients who returned for pre-ART care, 72% had their weight taken, 59% had a second CD4 count, and 18% were staged at least once during their second semester of care. In addition, while 16% of these returning patients became eligible for ART in the period based on staging or CD4 count, only half of eligible patients were actually initiated on ART.

Quality of ART care: At the first ART care visit, adherence to basic HIV clinical care standards (i.e., HIV typing, weight-taking, CD4 count, and clinical staging) was 90% or greater. Unfortunately, retention in care was low. Medical record data showed that by nine months after initiation in care, only 47% of ART patients had a documented clinic visit, and again retention was higher among children than adults. However, pharmacy records showed that one out of four patients received more than nine months of ARVs. Among patients who did return in the second semester of care, 80% were weighed and 66% had a second CD4 count. Compared to data collected at the initial visit, these patients gained a median of three kgs. Median CD4 counts increased by 170 cells/mm3 among adults, and CD4 percentage increased by 8 percentage points among children.

Quality of PMTCT care: Data for the PMTCT cohort were obtained mostly from registers rather than individual medical records. Among the 376 HIV-positive, prenatal women identified in January 2007, 67% received prophylaxis for PMTCT, and 43% of their newborns received prophylaxis at birth. Subsequent care for babies born to HIV-positive women was poorly documented. Among babies of HIV-positive mothers, only 11% received Cotrimoxazole, 9% were tested for HIV, and 17% received exclusive breastfeeding. Only one in four of the HIV-positive mothers were referred for HIV care, and only one baby in 10 born to HIV-positive women was referred for HIV care. Because register data are likely to be less reliable than individual medical record data, actual levels of care may be higher.

Discussion

For both the pre-ART and the ART cohorts, adherence to standards of care during the initial visit at the assessed sites was good. It was better among ART patients compared to pre-ART patients, and generally better among children compared to adults. Basic HIV care standards of HIV typing, weighing, clinical staging, and CD4+ T cell count assessment were all performed in at least 65% of patients. Adherence to standards of care was lower in the second semester of care for both cohorts. A number of clinical activities that were not conducted during clinical visits represent low-effort opportunities for providing care, including clinical staging, weight-taking, and patient counseling.

Retention of patients in HIV care was also poor. Six months after initiating care, two out of three pre-ART patients and 45% of ART patients were lost to follow-up, comparing unfavorably with retention figures from other studies in the African context. While some sites worked with local groups providing community HIV care, coordination of this care was a challenge.

Reliance on information documented in medical records and registers limited this assessment, which was illustrated when medical record data for the ART cohort patients were compared with pharmacy data.

Recommendations

We recommend initiation of facility-level quality improvement. A collaborative approach would take advantage of the considerable experience sites have in providing HIV care in Cote d'Ivoire and facilitate sharing of such practices. We recommend the following actions be implemented as part of a collaborative approach to quality improvement:

- Monitor a small number of quality indicators, especially indicators that track longitudinal care,
- Improve documentation and information systems for efficient information retrieval,
- Focus on addressing poor retention and medical record management, and
- Promote shared learning of innovations in HIV care, including task shifting experiences.

I. BACKGROUND

With an estimated HIV prevalence of 3.9% that includes both HIV-1 and HIV-2 viruses, Cote d'Ivoire has been greatly affected by the HIV/AIDS epidemic in West Africa. Wide disparities among genders, geographical regions and urban and rural areas characterize this devastating pandemic. While Cote d'Ivoire was one of the first countries in West Africa to roll out HIV/AIDS services—offered for more than a decade—it has continually faced significant challenges in implementing effective programs. A prolonged civil war, which started in 2002 and severely limited access to health services in the North and West of the country, likely increased the population's vulnerability as a result of military deployment; population and health personnel displacement; disruption of public services; and poverty resulting from political instability.

A long peace-building process, leading up to a 2007 agreement, allowed the country to renew focus on rebuilding lost ground. National policy[1] called for "strengthening the structural and institutional foundations (…), [which] requires genuine engagement of all sectors as well as de-concentration and decentralization of policies and activities." An important component of the structural foundation of a health program is a system that assures the quality of services provided. This assessment represents a step in the process of both improving the quality of care and strengthening the quality assurance system to maintain it.

It is in this context that the Ministry of Health and Public Hygiene (MOH), through PNPEC and aided by the USAID Health Care Improvement Project (HCI) managed by University Research Co. LLC (URC), organized an assessment of the quality of services provided to people living with HIV/AIDS. As a diagnostic study of the quality of services, this assessment focused on the quality of care given to patients in the HIV/AIDS care program, including ART, VCT, and PMTCT.

A. Purpose of the Assessment

With a goal of informing the design of a follow-on quality improvement program, this assessment aimed to identify key strengths and weaknesses in the HIV/AIDS care and treatment services in Cote d'Ivoire. The specific objectives were:

- To enhance and empower the capacity of the Ministry of Health's HIV/AIDS Care Program (PNPEC) to coordinate HIV/AIDS services in the country
- To engage key HIV/AIDS implementing partners (EGPAF, ACONDA, CARE, and ICAP) in activities to improve the quality of the HIV care and treatment program.

II. METHODOLOGY

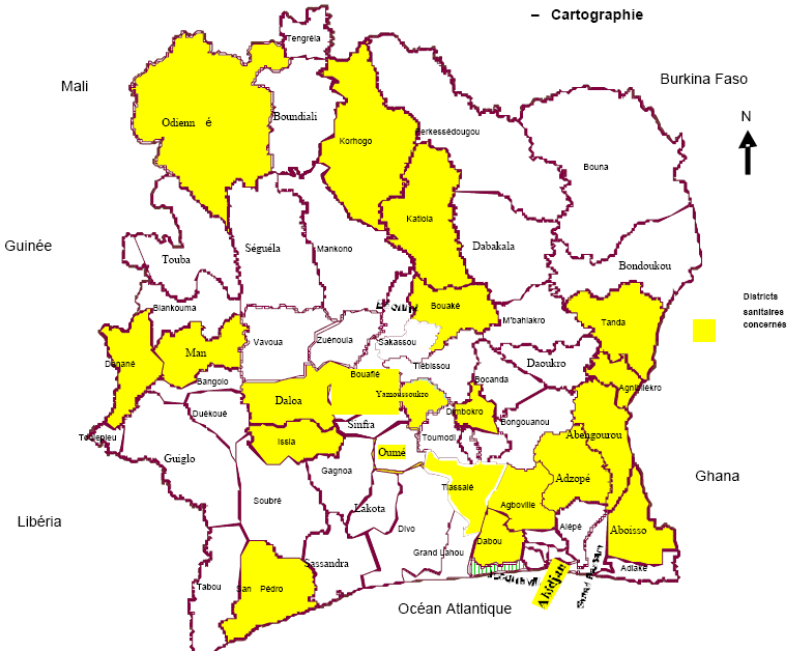
The current study was a retrospective assessment of the quality of care at public clinics and hospitals in Cote d'Ivoire.

A. Site Selection

Sites were selected, in conjunction with PNPEC, from all health facilities in Cote d'Ivoire offering HIV testing services using the following three criteria: (1) Each site should provide at least one of the two services: PMTCT or ART; (2) The different levels of the health system should be represented, including health centers, general, district and regional hospitals; and (3) The site distribution should be geographically representative. Figure 1 shows the distribution of the 41 sites identified.

[1] Politique Nationale de Prise en Charge Globale des Personnes Vivant avec le VIH dans le Secteur Sante, Ministère d'État et Ministère de la Santé et de la Population, Abidjan, 1ère Edition: June 2005.

Figure 1: Geographical spread of assessment sites



B. Data Collection

Tools used for this assessment were based on one developed by HCI and applied in an earlier HIV/AIDS quality of care assessment in Uganda. They were revised based on lessons learned from the Uganda experience, Cote d'Ivoire's national norms, and learning resulting from an April 2008 feasibility test at three sites in Cote d'Ivoire. A final revision of the tools was conducted during the training of data collection teams in discussion sessions with staff from PNPEC and HIV implementing partners. Data collection methods included interviews with HIV managers and ART patients and reviews of medical and pharmaceutical records and registers. Data were collected from the following services: VCT, PMTCT programs (including prenatal care, postnatal care, nutritional services, and immunization), ART services, and pharmacy.

Assessors were trained for two days in July 2008, with the second day taking place after assessors evaluated three sites in Abidjan to allow for process adjustments. Data were collected between July 9 and August 8, 2008 by three multidisciplinary teams, including staff from PNPEC/MOH, MOH district health management teams, implementing parters (CARE, EGPAF, ICAP, and ACONDA), and HCI/URC.

Table 1: Assessment tools and inclusion criteria

Assessment tool	Case definition/Inclusion criteria	Study population
Interview with provider or head of HIV services	All assessment sites	Representative sample of 41 sites
Pre-ART cohort assessment form	Persons who tested HIV-positive in June 2007 who did not start ART in the first 3 months of care	Cohort of 30 cases per site
ART cohort assessment form	Persons who started ART in June 2007	Cohort of 30 cases per site
PMTCT assessment form	Pregnant women in antenatal who tested HIV-positive in January 2007 or later	Cohort of 20 cases per site

1. Cohort Data

Key assessment data focused on three cohorts of patients. Historical patient data for a 12-month period were abstracted from medical records for two patient cohorts. The first cohort, henceforth referred to as the pre-ART cohort, consisted of HIV-positive patients who were not yet eligible for ART in the first three months and whose date of first contact at HIV care service took place in June 2007. The second cohort, the ART cohort, consisted of patients who initiated ART in June 2007. In both cohorts, if fewer than 30 cases were identified, assessors identified records in the immediately previous consecutive month until 30 cases were identified or until time constraints limited the search.

A third cohort consisted of prenatal care clients who tested HIV-positive in January 2007. Assessors identified 20 consecutive women for this cohort and attempted to retrieve PMTCT data for each woman using data from the existing information system (i.e., registers and, if available, medical records). Assessors relied on site staff to locate data sources.

2. Data Entry and Analysis

Three data specialists in Cote d'Ivoire entered the information collected into Excel sheets. Quality controls were then employed at the point of data entry using validation rules for documented records, which included checking data entry against data collection forms during the cleaning process. During this final step, data inconsistent with protocol logic were identified and rechecked against data collection forms. Data analysis was conducted using the STATA 8.0 package; analysis consisted of statistical descriptions of key variables using proportions.

3. Missing Data

For the ART and pre-ART cohorts, information regarding quality of care throughout the 12-month period of analysis was derived solely from medical record documentation. For example, time in care, the key variable for assessing retention in care, was calculated by subtracting the date of the last medical consultation from the date of initial visit. The sole exception was the data about monthly doses of antiretrovirals (ARVs) for each ART patient, which was retrieved from the pharmaceutical information system (computerized system or register, depending on the site). Similarly, data for the PMTCT cohort were derived from available written documentation, though, with few exceptions, this was mostly register rather than medical record information.

When evidence of care provided was not found in medical records or registers, it was interpreted as omission of care. This means that undocumented patient care was not accounted for because it was not possible to distinguish between absence of care and absence of documentation of care using existing documentation practices. This limitation may have been particularly pronounced for the PMTCT cohort, because register data are generally less detailed than patient records. It was also not possible to distinguish between patients who were lost to follow-up due to death from those lost from other causes.

4. Changes from Study Protocol

The original standard operating procedure for selecting records for the ART and pre-ART cohorts instructed assessors to identify cohort patients from an appropriate register. This procedure elected 30 random patients if more than 30 were eligible in June 2007. Both a systematic random selection of records and identification of medical records from registers proved to be impractical, given the short time frame for the assessment. Typically, HIV registers were organized by VCT numbering codes, representing a time-consuming step in the process of identifying the ART cohort.[2] In addition,

[2] Locating medical records identified in the register and that were not filed with the pre-ART records (i.e., files that were misfiled or being used) would have required time which assessors did not have. In addition, at many sites, pre-ART records were not filled in.

systematic random sampling procedures proved to be cumbersome given the time frame of fewer than two assessment days per site.

Another deviation from the protocol concerns the dates of inclusion into the HIV and ART cohorts. We found that some sites initiated HIV care after June 2007 (the inclusion period for both). Thus, in these sites, assessors collected data from the earliest period before January 2008. Data abstracted from records identified after June 2007 were retained for analysis of the initial consultation into HIV or ART care, but excluded for other analyses. For records that were abstracted at certain sites, time constraints still limited the sample size to fewer than 30 patients for the pre-ART and ART cohorts. The Appendix shows the number of records reviewed and interviews conducted in each assessment site.

III. FINDINGS

A. Patient Information Systems and Data Quality

There was considerable variation in methods of documenting patient care across sites, ranging from notebook registers, loose-leaf longhand doctor notes, standard consultation forms, and the MOH-issued patient record. Among records with longhand documentation of patient visits, a standard form was often used for the initial check-up. This raises the question of whether lack of forms for documenting follow-up visits may be one reason for the forms' irregular use. Moreover, documentation systems appeared to be in flux, with various sites reporting new information systems being introduced after June 2007, with new consultation forms, patient records, registers or drug management software. Generally, it was apparent that having standard forms increased the level of documentation. For example, evidence of TB assessment tended to be documented in standard HIV care intake forms but was absent when the forms did not prompt the provider to record TB assessment. Similarly, since most forms were not designed to prompt recording of counseling given, thus very little counseling was actually documented.

B. Pre-ART Patient Care

1. Patient Information Systems and Data Quality

Pre-ART records were systematically available at most of the sites. Some sites transitioned to individual HIV patient records during the 12-month follow-up period. Typically, a new HIV medical record was started at or shortly after an initial HIV visit,[3] during which a medical history and physical exam were performed and a blood sample drawn for a battery of tests, including the CD4+ T cell count.

In some sites, the pre-ART patient records were kept separately from ART records. In other sites, the records of patients who had *ever* returned for a follow-up HIV care visit, whether before or after ART eligibility, were set apart from other records. Assessors were often introduced to these groups of records first, whereas records of pre-ART patients who had not returned after the initial visit were kept separately at such sites. This record-keeping resulted in a sampling bias that would overestimate the retention level of pre-ART patients.

One out of three medical records with documentation of any follow-up consultations after the initial visit used no standard forms to document follow-up patient visits (147/394, or 37%). Providers at some sites noted that stock-outs of medical record forms and registers were a recurring problem.

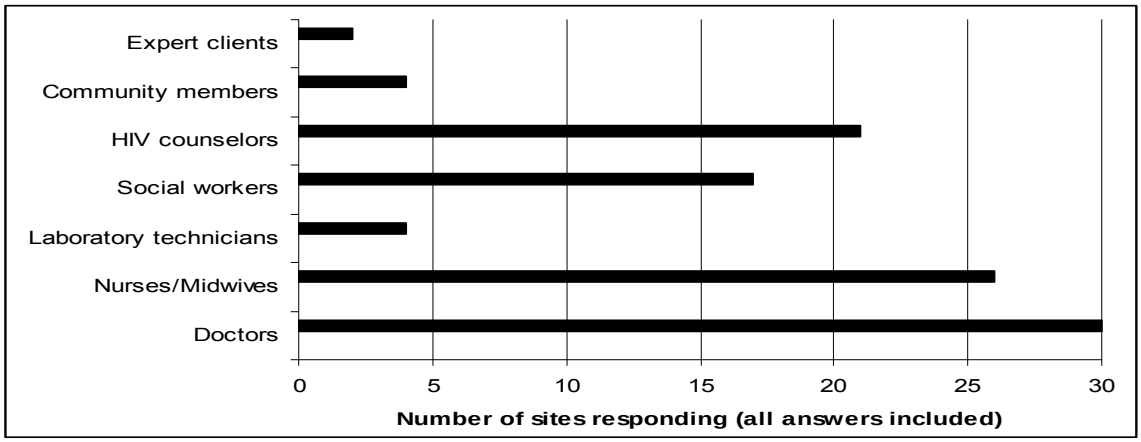
2. Workforce Issues

A principle of good chronic disease care is the use of multidisciplinary teams, reserving limited and expensive physician time for the sickest patients rather than using it for routine activities. Good counseling, while a key activity in HIV prevention, is a far more transferable skill than other physician skills. In this context, we found that physicians were the cadre most reported to provide HIV counseling

[3] Usually on a later date than the date of the first HIV-positive test.

(Figure 2). At the same time, nurses in more than 80% of the sites also provided HIV counseling, and two-thirds of the sites assessed had HIV counselors on staff.

Figure 2: Voluntary counseling and testing: Who provides counseling?



3. Descriptive Results

We reviewed 653 pre-ART records from 30 sites, including records of 607 adults (age ≥ 15) and 34 children. (Note that 12 records did not identify the age of the patient.) Of these, there were 475 adults and 27 children with 12 months of follow-up, including 151 adults and 12 children who received care after the sixth month (M6).

Table 2 summarizes some of the descriptive characteristics of the pre-ART cohort at the first consultation. The cohort had a median age of 33, and half were married or partnered. Three out of four patients were female, suggesting under-representation of men.[4] However, men were nearly twice as likely as women to have a CD4+ T cell count of less than 200 (Table 3). Five percent of the cohort had HIV-2 infection. At care initiation, adults weighed a median of 56 kilograms and had a median CD4+ T cell count of 435 cells per mm.[3] Median time in care was 60 days, with a median of one follow-up visit.[5] Fifteen percent of patients who were in care for longer than six months initiated ART, among whom fewer than one in three received any ART-documented counseling.

4. Quality of Care

a. Initial consultation

The main objectives of the clinical follow-up of HIV-positive patients before they are eligible for ART are to "assess the advancement of the HIV infection [and] prevent […] detect and treat opportunistic infections" (Cote d'Ivoire National HIV/AIDS Guidelines, 2nd edition, August 2005). In order to achieve this goal, national standards state that patients are to receive a physical exam[6] and appropriate lab tests—in particular a CD4+ T cell count—every six months.[7] These tasks help the physician assess at what stage of the HIV infection the patient is and whether ART initiation is warranted.

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[4] HIV prevalence in Cote d'Ivoire among women is nearly twice as high as among men, according to the 2005 Cote d'Ivoire AIDS Indicator Survey implemented by MEASURE DHS.

[5] We defined a follow-up visit or consultation as any physician visit after the first, as documented in the patient record.

[6] CDC staging is determined by both the physical exam and the CD4+ T cell count, while WHO staging is based on the former and % weight loss.

[7] However, depending on the clinical state of the patient, this can occur more often.

Table 2: Pre-ART data from medical records

All medical pre-ART records reviewed	Number responding	Percentage	Median (range)	n n= *653*
Male	172	26.3%		
Age	640	98.0%	33.0 (0-73)	
Marital status among adults recorded	568	93.6%		607
Married or partnered among adults	314	51.7%		607
HIV-2	32	4.9%		
HIV counselling recorded[8]	82	12.6%		
Initial weight recorded (kgs)	474	72.6%	56 (30-109)	607
Initial CD4 among adults recorded	510	84.0%	435 (5-2109[9])	607
Baseline WHO stage recorded	157	24.0%		
Baseline CDC stage recorded	359	55.0%		
TB: any evidence of clinical exam, medical history assessment, sputum, chest x-ray or Isoniazid	392	60.0%		
Last weight recorded among adults	215	35.4%	59 (33-110)	607
Records of pre-ART patients with 12 months of follow-up				**n= *508***
Time in care, in days			60 (0-365)	
Number of medical checkups			1 (0-19)	
Initial and last weight recorded among those in care for >30 days	184	41.5%		443
2nd CD4 recorded among patients in care >6 months	99	76.2%		164[10]
2nd stage (WHO or CDC) among patients in care >6 months	32	19.5%		164
Any evidence of Cotrimoxazole recorded among adults with WHO 2, 3, 4 or CD4<= 350	81	60.4%		134
Patients in care >6 months who started ART	25	15.2%		164
Patients who received ART counseling among those in care >6 months and who started ART	7	28.0%		25

[8] Documentation that patient received or was referred for counseling at least once at VCT or as part of a support group.

[9] There were six CD4 readings among adults > 1500.

[10] Independent of age information.

Table 3: Initial CD4+ T cell count

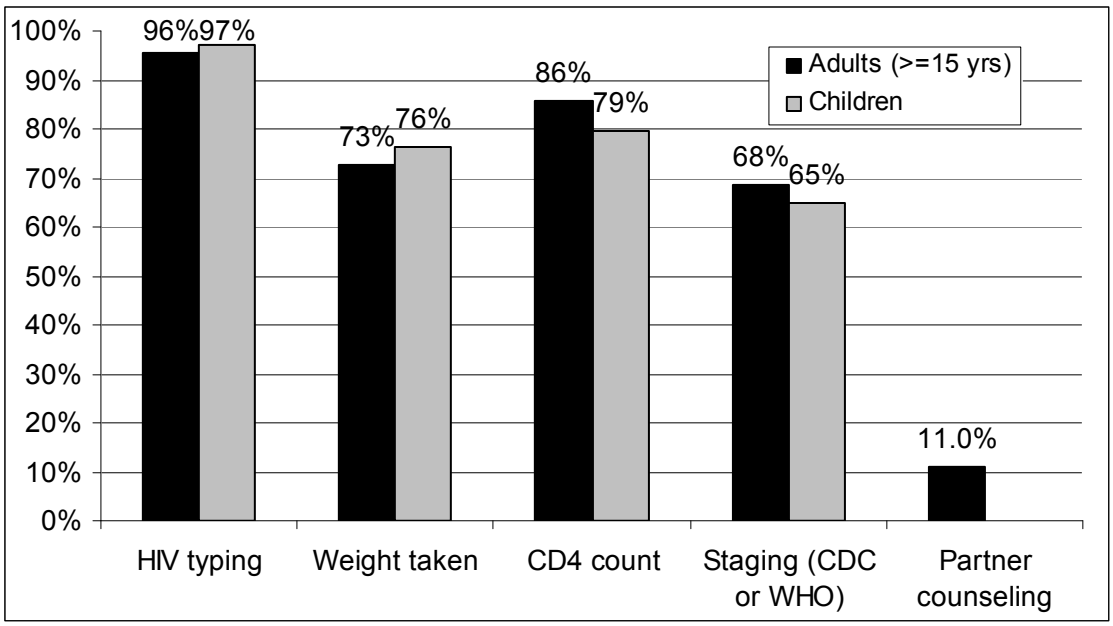
By gender among pre-ART cohort (n=450 women and 152 men)

CD4	Women		Men	
< 200	36	8.0%	22	14.5%
200 – 350	85	18.9%	26	17.1%
350 – 500	98	21.8%	33	21.7%
> 500	161	35.8%	46	30.3%
Missing	70	15.6%	25	16.4%

Assessing initial consultation records (Figure 3), we found that basic standards of HIV care were adhered to and documented in at least two-thirds of the records reviewed. CD4+ T cell counts were conducted in 84% of patients, though staging was performed in only 67% of all patients. In addition, HIV typing[11] was performed at a high level of 94% of all cases, contrasting with only 72% of all patients having a documented baseline weight. This appears to be a lost opportunity, as weight-taking requires relatively low levels of technology and staff skills. Finally, national standards state that a chest x-ray is needed at M0, M6 and M12. As shown in Table 2, 60% of patients had documented TB assessment.

Figure 3: Adherence to standards of care documented

Noted in medical record during first clinical visit among adults (n = 607) and children (n=34)

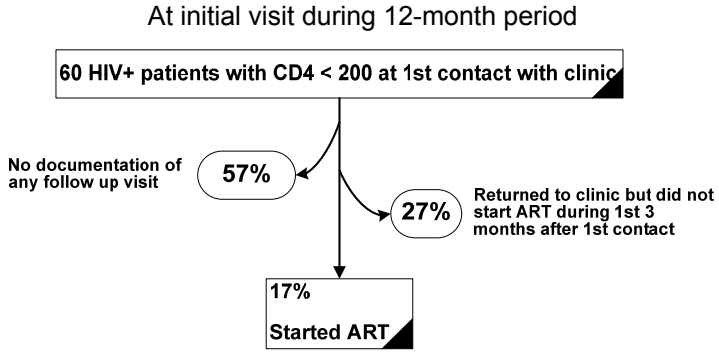


One recurring theme was the need to improve counseling—or at the least, its documentation. Documentation of counseling helps providers give more effective and targeted counseling in subsequent visits; it is a key health system tactic to support self-management of the HIV infection and reduce transmission. Only one out of eight patients received HIV counseling that was documented (Table 2), and only 11% received documented partner testing.

[11] HIV typing is necessary for all new HIV-positive patients in Cote d'Ivoire because, due to the presence of HIV-1 and HIV-2, typing is necessary for determining an appropriate ART regimen.

There were 60 patients with AIDS as defined by a CD4+ T cell count (<200). All of these patients should have been initiated immediately on ART, which would have made them ineligible for the inclusion criteria for this cohort. Instead, only 17% were started on ART during this 12-month period (see Figure 4).

Figure 4: Outcome of 60 HIV-positive patients with CD4 <200

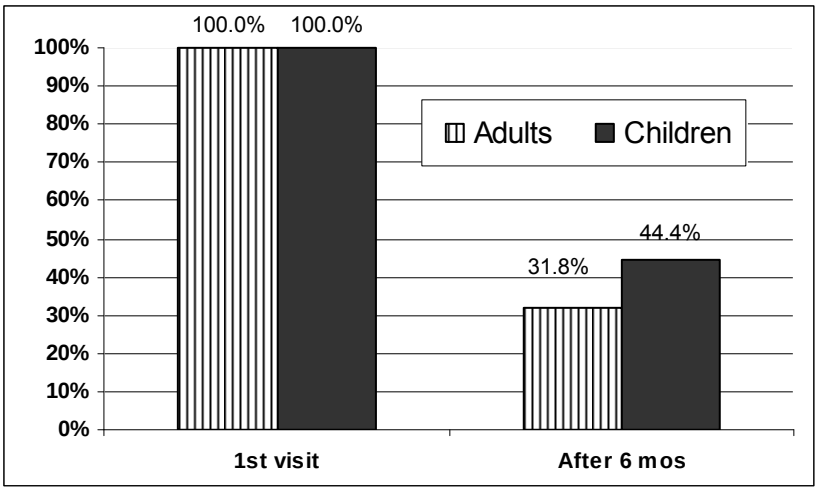


5. Retention in Care and Quality of Care of Follow-up Visits

Unfortunately, the attrition rate after the initial consultation was very high. To adhere to national norms, pre-ART patients need to have a clinical visit every six months. As can be seen in Figure 5, only one out of three pre-ART patients who started out in care returned for a doctor visit six to 12 months afterward. Retention in care among children was at a higher level (44.4%) than for adults.

Figure 5: Care retention in adults and children

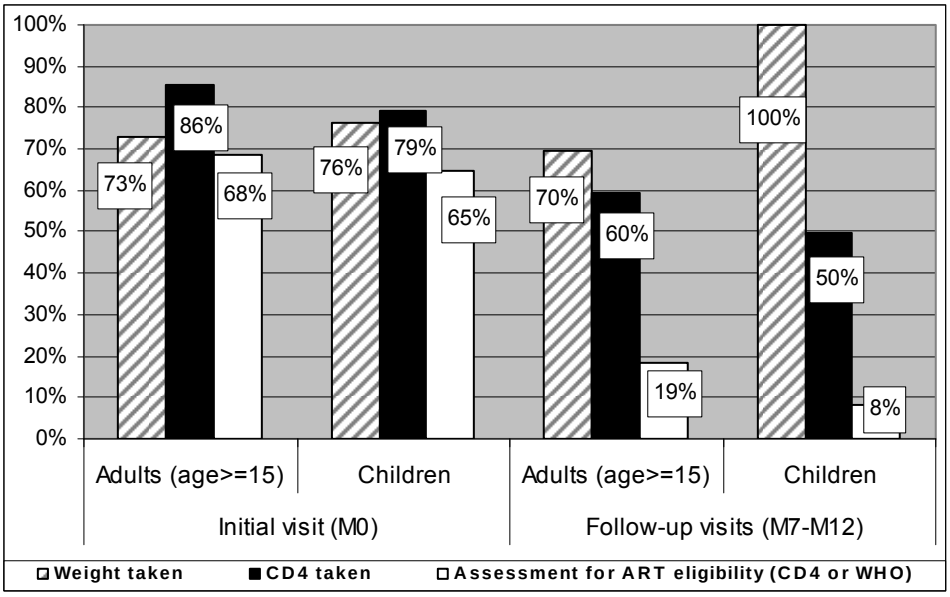
Adults age ≥ 15 (n=475) and children (n=27) with 12 months follow-up



Unfortunately, those who did return for HIV care received lower quality of care in their second semester: the initial rate of obtaining CD4 tests was reduced by 30%, and the rate of having clinical staged performed was reduced by 72%. It should be noted that providers at several sites cited stock-outs of CD4 lab reagents as an obstacle to patient care. A similar pattern was observed among children. Adherence to these same care standards was also lower in the second semester of care among children, though only 12 children received care after M6 (see Figure 6).

Figure 6: Adherence to standards of care

Comparison of initial visit and follow-up visits (M7 to M12). Initial visit: Adults (n = 607) and children (n=34); Follow-up visits: Adults (n=151) and children (n=12)

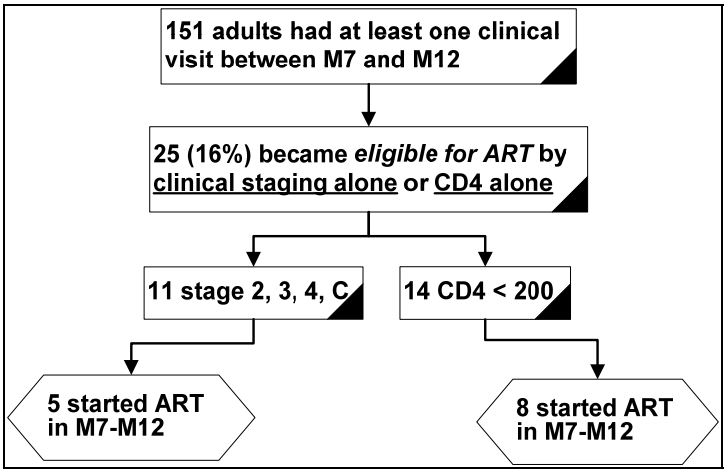


a. Outcomes

An important outcome of HIV care for pre-ART patients is timely initiation of ART. National norms define that a patient is eligible for ART by staging alone at WHO stages 2, 3, 4 or CDC stage C and by CD4+ T cell count alone if CD4 <200. By these two defined measures, there were 25 patients who should have become eligible for ART in the second semester of care. Yet, as seen in Figure 7, only roughly half of the 25 initiated ART.

Figure 7: Number of adults who started ART

Adults (age ≥ 15) among those who became eligible between M7 and M12 by CD4+ T cell count or clinical staging



B. ART Patient Care

1. Patient information system and data quality

Data collection for the ART cohort utilized the same sources (i.e., individual medical records and registers) as for the pre-ART cohort. As with the pre-ART cohort, there was considerable variation in data quality. In one site, ART patient data was limited to a notebook with hand-drawn columns documenting a small amount of information about each patient. In another site, an electronic copy of the patient medical record was said to be available.

a. Confidentiality: A challenge to information access

Safeguarding confidentiality of ART patient data was an issue that arose during the assessment. At one site, assessors were not able to access data about ART patients because the prescribing physician did not allow it. Similarly, at another site, a prescribing physician restricted access to patient data from his colleagues, which meant that his patients could not be seen by any other provider. In yet another site, a local NGO providing follow-up care to HIV-positive patients appealed to the member of the assessment team from the MOH to help improve coordination (i.e., access to patient information) with the general hospital in order to provide better care for patients. At the hospital, the prescribing physician cited patient concern with confidentiality as the main obstacle to improved coordination.

b. Pharmaceutical information system

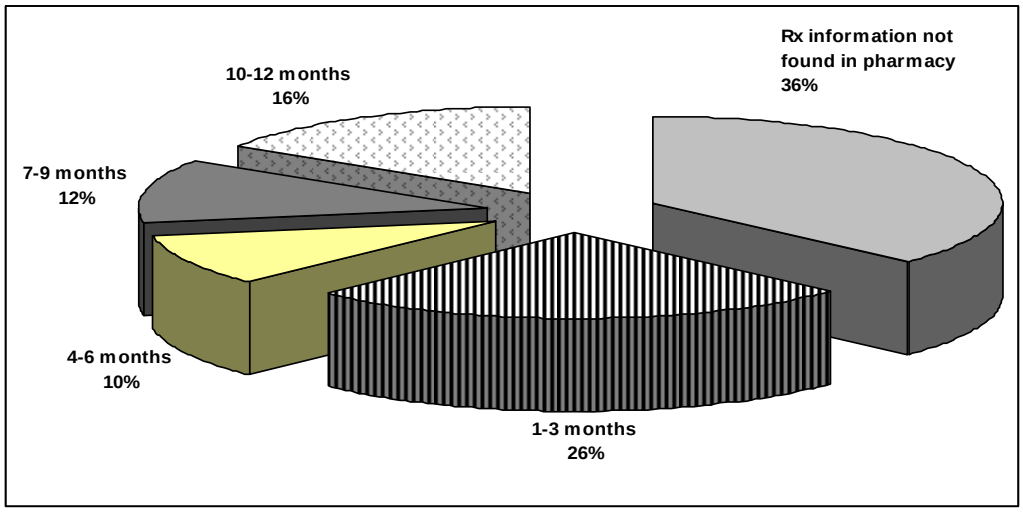
There also appeared to be information management challenges with the use of different pharmaceutical software. Pharmaceutical data were managed using either government-issued registers or software provided by an HIV implementing partner. In some cases, staff members present at the site on the day of the assessment were not able to retrieve data about patients because the person who knew how to retrieve data was not present or because staff were only trained on entering data into the system and not on retrieving them. At other sites, either the computer or the ART management software was not working on the day of the assessment. One site had implemented two different programs during the target 12-month period before finally reverting to hardcopy registers.

In this context, we identified 400 adults for whom there were 12 months of follow-up and for whom ART data were found at the pharmacy. Lack of information in the pharmacy information system could mean that the patient did not receive any ARVs from that particular pharmacy or could signal the inability of the pharmacy to provide the data or that the pharmacist was not able to find pharmaceutical information for a particular patient since most systems did not try to link medical records with pharmaceutical data.

As an illustration of the poor state of documentation, we examined the ART data obtained from the pharmaceutical information system for patients who had no record of a follow-up clinic visit in their medical record after an initial visit. One would expect that shortly after their first visit, new ART patients would pick up their first ARVs from the pharmacy. If all patients who did not return for a follow-up visit received no further care or treatment, one would expect that they would have received no more than three monthly doses of ART because pharmacies in Cote d'Ivoire rarely dispense more. Instead, as seen in Figure 8, 38% of patients who had no record of a follow-up visit actually were registered at the pharmacy as having picked up four-to-12 months of ART. In short, looking at the pharmaceutical data of patients with no documentation of follow-up visits after initiation of ART demonstrates that more patients received treatment than their medical records suggest. In fact, an assessment supervisor reported that at one site, patients systematically picked up their ARV supplies without a physician checkup first and regularly saw the physician without any documentation of the visit.

Figure 8: Number of monthly doses of ART

ART dispensed during a 12-month period to adult (age ≥ 15) patients with no record of follow-up clinic visit (n=133)



2. Workforce Issues

As part of this assessment, we interviewed the chief physician for HIV/AIDS care or the available prescribing physician at 33 sites providing ART services. We asked them to list the activities a patient experiences during a typical follow-up visit and which staff they see. Half the sites reported working with non-physician staff for gathering clinical information, providing counseling, or information, education and communication (IEC) activities. At over half of these sites, these personnel were also taking vital signs, weighing the patient, and drawing blood samples. Non-physician staff at four sites assessed adherence. Physicians were working alone at five sites (not counting lab technicians and pharmacists), and at two sites they were taking vital signs.

3. Descriptive Results

We assessed 800 medical records of ART care from 33 sites, including records of 749 adults and 40 children. Of these, there were 612 records of adults and 37 records of children with 12 months of follow-up, including 54% of adults and 73% of children who were in care for more than six months.

As shown in Table 4, ART patients were female by a 2:1 ratio (68% female, 32% male), reflecting the gender pattern in national prevalence estimates. The median age of ART patients was 36, and their median weight was 52 kgs., reflecting a group both older and less heavy than the corresponding pre-ART cohort. Four percent were infected with HIV-2, and 9% were documented as having received TB treatment. Median time in care was nearly 10 months, and the median number of follow-up visits during the 12-month period was four. More than half the patients were on the regimen of D4T, 3TC, and NVP (Figure 9), and 11% changed regimen during the follow-up period.

Table 4: Descriptive data from the ART cohort

All medical records (n=800)	Number responding	Percent	Range	Median	n
Male	259	32.4%			
Age			0.1- 67	36 (0.1-67)	
HIV-2	31	3.9%			
Initial WHO stage					245
1	59	24.1%			
2	65	26.5%			
3	104	42.4%			
4	17	6.9%			
Initial CDC stage					566
A	88	15.6%			
B	352	62.2%			
C	126	22.3%			
Initial weight (kgs)	721	90.1%		52 (4-103)	
TB treatment received	69	8.6%			
Initial CD4 among adults					
< 200	71	15.2%			
200 – 349	87	18.6%			
350 – 499	56	12.0%			
> 500	45	9.6%			
Patients with 12 months follow-up (n= 659)					
Number of medical check-ups				4 (0-121)	
Time in care, in days				292 (0-365)	
Adherence recorded in last visit	215	32.6%			
Last weight	537	81.5%		57 (4-108)	
Last CD4+ T cell count among adults					356
< 200	51	14.3%			
200 – 349	77	21.6%			
350 – 499	45	12.6%			
> 500	37	10.4%			
Changed ARV regimen	72	10.9%			

4. Quality of Care

a. Initial consultation

Adherence to selected standards at the initial ART visit was very good: more than 90% among both adults and children and notably better than adherence to the same standards for the pre-ART cohort (see

Figure 10). The exception among the basic norms we assessed was the documentation of contact information, which is a key action to enable any health system to increase adherence to ART. Thirty-two (4%) patients who were prescribed ART did not have a CD4+ T cell count in their medical record. In at least one site, it was standard procedure to put patients on ARVs before CD4 results arrived, meaning that all HIV-positive patients were on ARVs, independent of eligibility.

Figure 9: Initial regimen

All ages included (n=800)

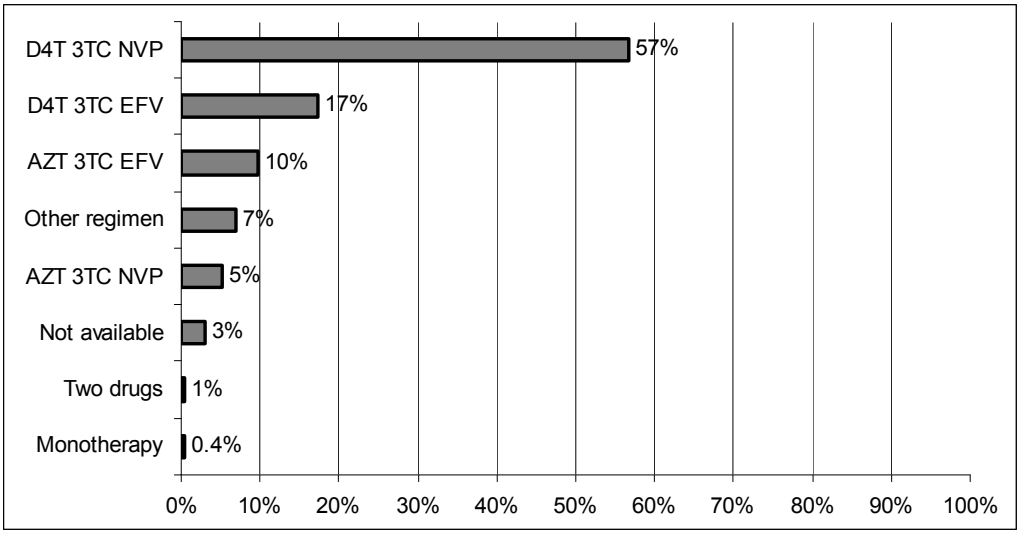
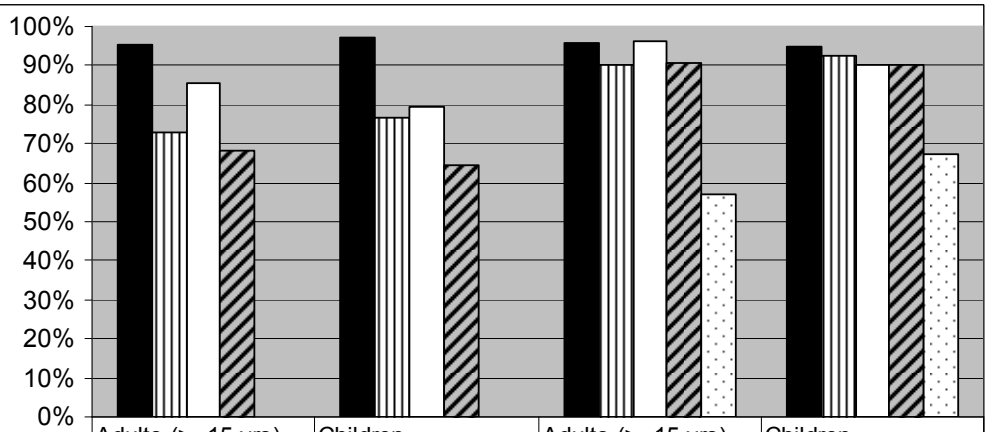


Figure 10: Adherence to standards of care documented in medical record during initial visit

Comparison between pre-ART cohort (adults n = 607 and children n=34) and ART cohort (adults n = 749 and children n=40)

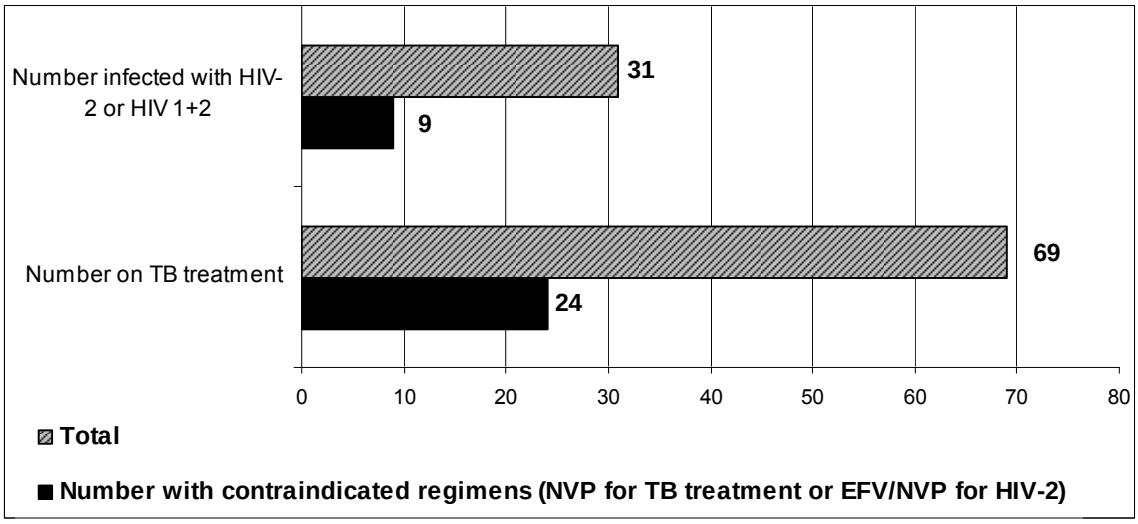


	Pre-ART		ART	
■ HIV typing	96%	97%	95.9%	95%
◫ Weight	73%	76%	90.3%	93%
□ CD4	86%	79%	96.3%	90%
▨ Staging (CDC ou WHO)	68%	65%	90.5%	90%
□ Contact documented			57%	68%

We also looked at the ARV regimen prescribed. As noted in Figure 9, there were less than 2% of prescriptions of only one or two ARVs. In addition, about one in three patients with HIV-2 or TB were prescribed a regimen that is contraindicated by national and international norms (Figure 11).

Figure 11: Number of cases with ART prescription

At initial visit that included contraindications, all ages



5. Retention in Care and Quality of Care at Follow-up Visits

PNPEC recommends that patients in their first year of ART care return for follow-up visits every three months.[12] In addition, national norms set the standard of six monthly assessments, which include a physical exam (includes weight-taking), CD4+ T cell count, and monitoring of tolerance and adherence to the drug regimen.

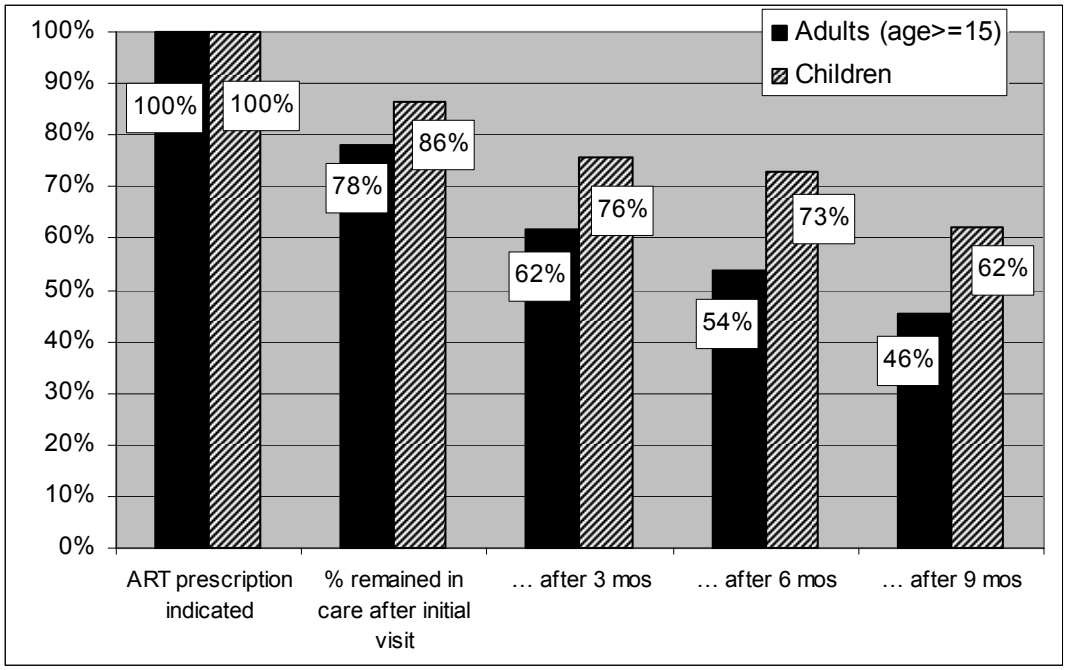
Figure 12 shows that among adults and children with 12 months of follow-up, retention in care was better among patients on ART compared to that of pre-ART patients. However, this progress is still extremely low for a drug that extends the life of a patient with a serious chronic illness. Three months after initiation, 63% of the original population was still in care. After six months, only 55% remained in care. The rate of retention in care was 10% to one-third higher among children compared to adults.

Another way to examine the question of retention, given poor documentation systems, is to look at the number of monthly doses of ART dispensed for the cohort. In contrast with the findings earlier in this report on patients with no documentation of follow-up visits, pharmaceutical data for *all* adults painted a decidedly less optimistic picture of retention in ART. For example, in the best case scenario, Figure 12 shows that 612 adult patients could have initiated treatment, as ARV prescription was noted in their medical record. However, looking at the same 612 patients in Figure 13, the pharmacy data shows that 35% never picked up ARVs at the pharmacy, were not registered as having picked them up, or the pharmaceutical information system was not able to find data on these patients. Similarly, while retention analyses show that 46% of adults were still in care nine months after initiating ART (i.e., had a recorded visit to a physician in their medical record), pharmaceutical data show that only one out of four patients received more than nine months of ARVs.

[12] Verbal communication on week of 16 Feb 2009 with Dr. AYEKOE Adou, Service de Prise en Charge, PNPEC, Ministry of Health. The recommendation also includes a visit on Day 14 after initiation.

Figure 12: Quarterly retention in care after ART initiation among patients

With 12 months of follow-up (n=612 adults, n=37 children)



This means that patients who returned for follow-up visits may still have not received drugs. We can infer that this would have been due to barriers other than geographic ones, since in Cote d'Ivoire, ART sites are authorized by PNPEC only if there is access to ARVs onsite or in close proximity to the site (i.e., where the doctor's consultation room is). In fact, among this cohort of adults, we did not find pharmaceutical records of ARVs dispensed for 57% of the patients who were in care for one to less than three months;[13] for 22% of those in care for three full months to less than six months; and for 31% of those were in care for six to less than nine months. In short, if retention in care were defined as *retention on ART*, the figures would be lower still than Figure 12 would suggest.

As with the pre-ART cohort, ART patients that did stay in care were less likely to receive care at the same level of quality as they did in the first visit. As shown in Figure 14, the initial rate of weight-taking was significantly reduced[14] (by 11%) in the second semester of care, and the initial rate of receiving a CD4+ T cell count was also significantly reduced (by 31%). Furthermore, adherence was documented in only one-third of cases.

[13] Or, more precisely, more than 0 months and less than 3 full months.

[14] $p < 0.0001$

Figure 13: Number of monthly doses of ART

Dispensed to adults (age ≥ 15 years) with 12 months of follow-up (n=612)

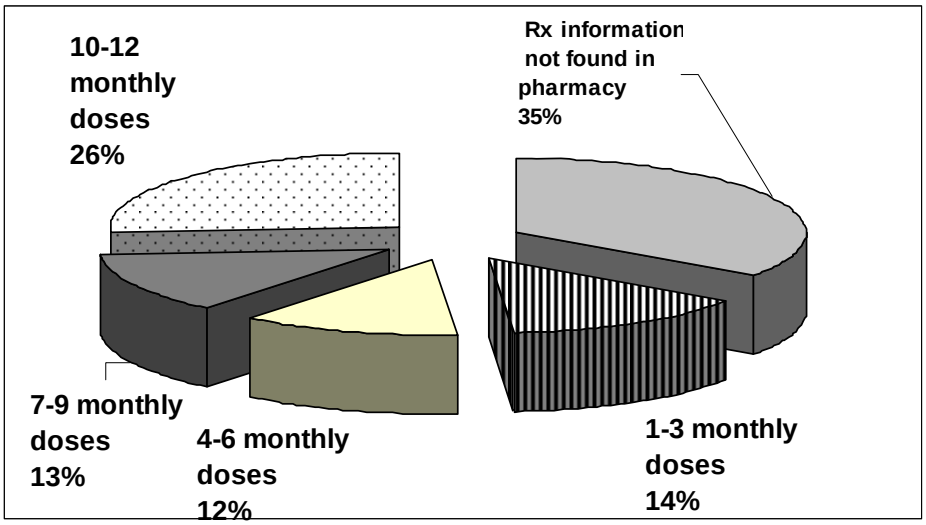
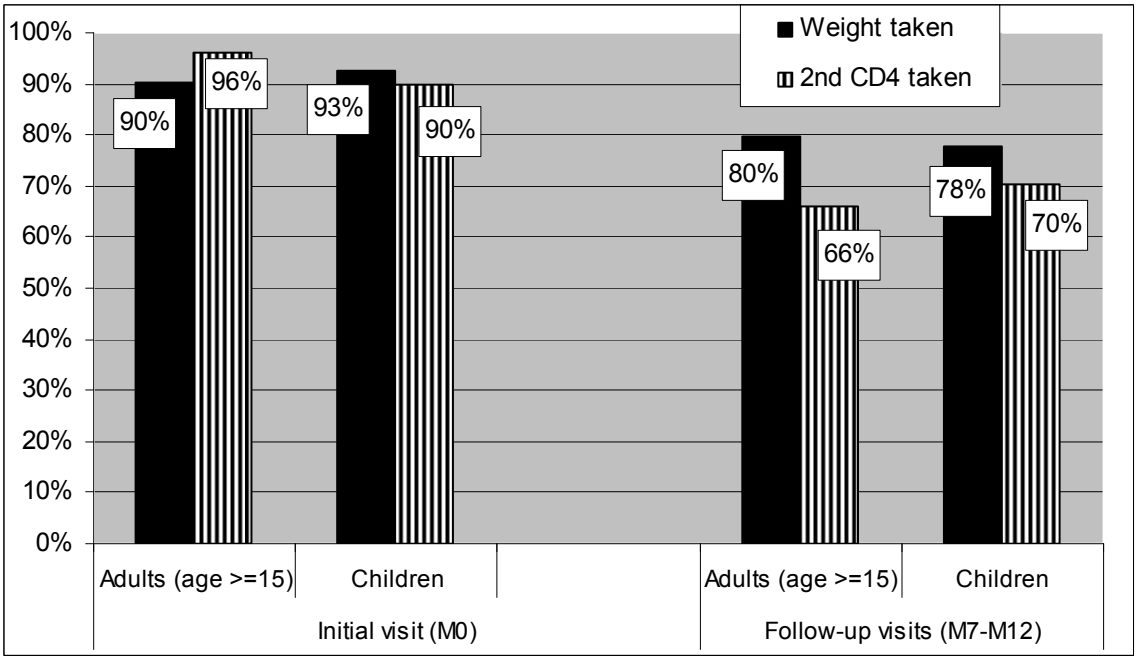


Figure 14: Adherence to standards of ART care

Comparison of initial visit (M0) to 2nd semester care (M7 to M12) as documented in medical record (At M0, n = 749 adults, n=40 children; at M7-M12, n=331 adults, n=27 children)

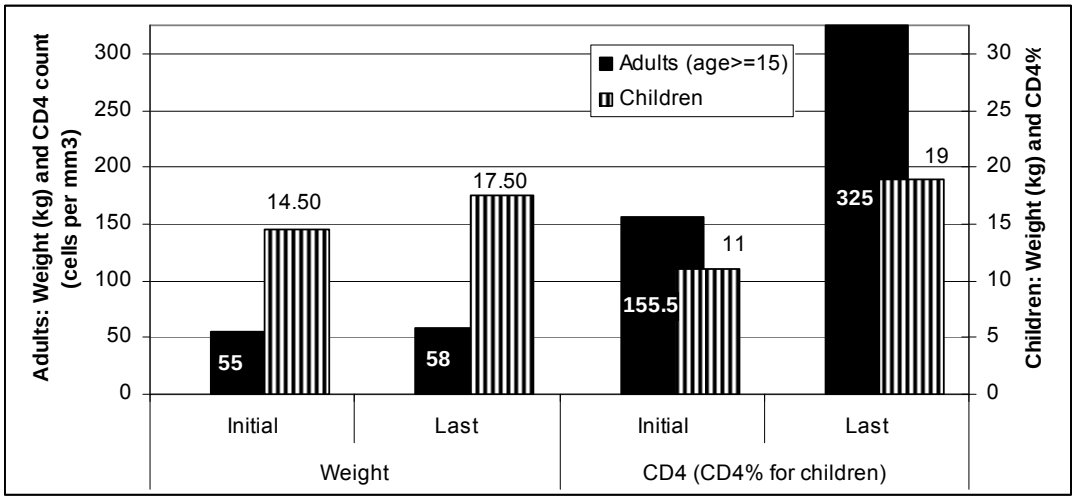


a. Outcomes

At the level of the individual ART patient, what matters most from the health system's point of view is that health outcomes improve. Among patients that were in care for at least six months, there was a significant[15] increase in weight (Figure 15) compared to the initial visit among both children and adults. There was also a significant[16] increase in CD4+ T cell count among adults and CD4+ T cell percentage among children.

Figure 15: Change in median weight and median CD4

First to last consultation for patients in care for at least 6 months and with 12 months of follow-up (n = 331 adults; n=27 children)



C. PMTCT Care

1. Patient Information System and Data Quality

Of the three cohorts assessed, the PMTCT cohort had the most information system problems. In most cases there were no individual records for this cohort, such that information had to be retrieved from notebooks and registers in antenatal care, nutrition, immunization care, labor and delivery and HIV care. In some sites, there were system design issues that did not allow for identification of PMTCT assessment data. For instance, in some places there was no formalized information system for capturing postpartum care for the mother, or for children of HIV-positive mothers.[17] In another site, delivery dates were not documented so that providers would have to guess when the child reached the HIV-testing age. In a number of sites, assessors searched for patients by name because there was no patient coding system that would allow for identification of the patient in the various registers—a practice that raises questions of patient confidentiality and efficiency. Some PMTCT sites only offered postnatal care services (i.e., no prenatal or labor and delivery), thus underlining the importance of utilizing a coherent patient identification system across sites. A number of sites used improvised documentation systems, including an antenatal care register, given the lack of standard forms to capture key PMTCT data.

[15] $p < 0.0001$

[16] $p < 0.0001$

[17] In more than one occasion assessors were handed a piece of paper with lists of children's names.

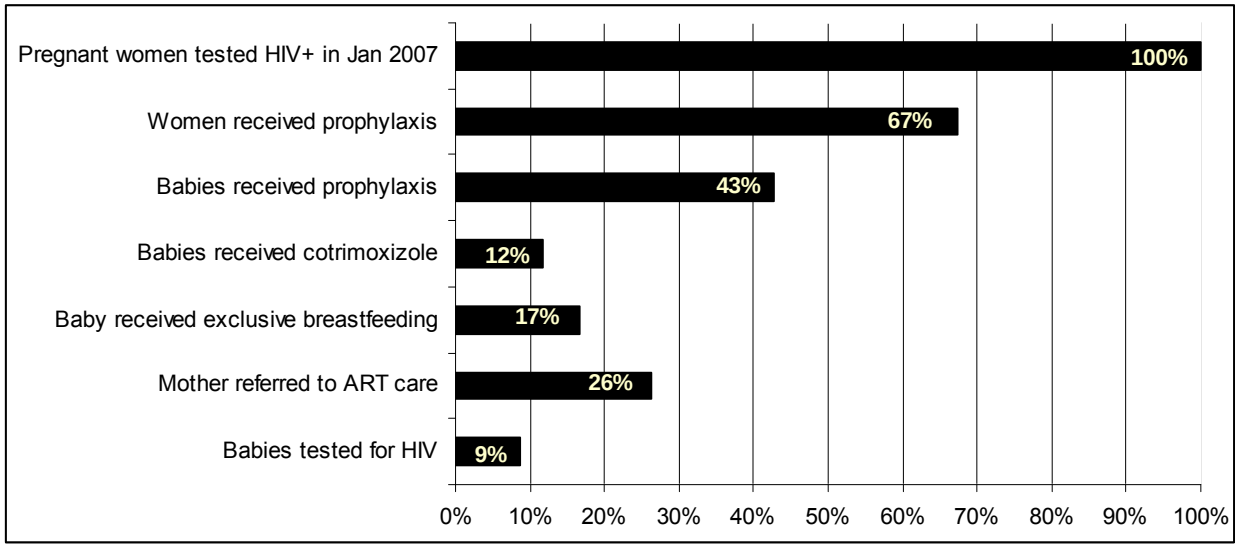
2. Quality of Care

Assessors identified a cohort of 376 women who tested HIV-positive at their first antenatal care visit at 26 sites in January 2007. Registers and patient records, where available, were assessed for evidence that cohort members received six key PMTCT care actions, which are listed in Figure 16.

Adherence to care standards was low. Two out of three women who tested HIV-positive were documented as having received prophylaxis during delivery, and less than two-thirds of the babies born to women who received prophylaxis also received the treatment. One area of particular concern is the linkage with HIV care: only one out of four HIV-positive women was referred to these services. This is an unfortunate missed opportunity because providing a referral is a low-effort activity that most sites were not able to ensure or document. The negative consequences of not being connected to HIV care can be far reaching. If the mother is not able to stay proactively in good health, this is likely to affect the care she will be able to provide to her infant, including bringing the child back for check-ups, immunizations, prophylaxis, and HIV testing. In addition, greater contact with the health system suggests more opportunities for counseling and to communicate IEC messages.

Postpartum care for this cohort was also problematic. The frequency of key PMTCT actions executed decreased dramatically after delivery, with fewer than 10% of babies of HIV-positive women documented to have been tested for HIV. Given the difficulty in identifying the data sources to conduct this assessment, the greater challenge appears to be in tracking and identifying women and their children postpartum rather than in providing them the right care once they are identified.

Figure 16: Outcome of a cohort of HIV-positive women in the PMTCT program



IV. DISCUSSION

Adherence to basic standards of HIV/AIDS care among patients during their initial visit at the assessment sites was generally good. It was better among ART patients compared to pre-ART patients, and generally better among children compared to adults. Most sites initiated patients into HIV care according to MOH standards and prescribed the first-line regimen. The basic care actions of HIV typing, weight-taking, clinical staging and CD4+ T cell count assessment were each performed in at least 65% of patients. Considerably lower adherence to basic standards of care was documented in the second semester of care for both pre-ART and ART cohorts, including activities that represent relatively low investment on the part of the health system: clinical staging, weight-taking, counseling, IEC, assessment

of adherence to ART, registering of patient contact information, and TB assessment. These results represent missed opportunities in providing care that have potential of yielding high returns on investment.

However, it is clear that retention of patients is a far more significant issue. Six months after initiating care, two out of three pre-ART patients and 45% of ART patients were lost to follow-up. This compares negatively with retention figures reported in previous studies in other countries in the African context.[18] While some sites had links with local NGOs to provide community HIV care (i.e., *prise en charge communautaire*), how to best coordinate with them remained problematic for some sites. Retention of HIV-positive women in the PMTCT program was worse and had potentially greater consequences. The first MTCT prevention action after identification of the HIV-positive woman—provision of prophylaxis for the woman in labor—was achieved in only two-thirds of the cohort. This is unlikely a problem that can be explained by poor documentation alone, since tracking or identification of the HIV-positive woman after her initial HIV test is a necessary first step to providing the required post-natal care.

Assessment of the PMTCT cohort also made apparent the serious challenges in linking different services within the same health facility, as well as the need for a supporting information system that would allow for efficient identification and monitoring of women throughout the different services to assure prevention of HIV transmission. We also found that counseling was often reported during interviews to be routine care to HIV-positive patients, and thus it appeared to be underreported in the documentation system.

A significant limitation of this assessment was the reliance on information documented in medical records and registers, which as noted above, could be improved. Figure 8 is a stark reminder of the limitations of the current documentation system. That said, it was apparent during the assessment that in the western part of the country, new documentation systems had already been put in place in a number of sites. Thus, improvement of the documentation system has already been initiated.

An area that appears quite promising for future improvement activities is the rational distribution of clinical tasks among the different cadres of health workers. In this regard, there was considerable variation among sites. At some sites, physicians carried the burden of providing all HIV care to patients. At other sites, simple clinical and administrative tasks as well as IEC and counseling were shifted to non-physician cadres. Such experimentation at the individual site level is extremely positive, because the solutions that are tested at one site can help inspire similar change in similar sites.

There is anecdotal evidence that a number of sites, including some that were most isolated during the civil war, have taken a proactive degree of freedom in adapting to site-specific needs. Some examples of innovation include the development of an Excel tool to track patients longitudinally, which was being developed by a prescribing physician; the implementation of a triage policy allowing ART patients to bypass the physician during certain follow-up visits; and the use of a non-clinical staff person for medical record filing and retrieval, as well as patient weighing. Different approaches specific to each of the HIV implementing partners are also an opportunity for shared learning.

[18] A review of 32 studies by Rosen et al. covering the period 2000-7 reported that ART programs in Africa were retaining, on average, 80% of their patients after six months on ART. See Rosen S, Fox MP, and Gill CJ. 2007. Patient retention in antiretroviral therapy programs in sub-Saharan Africa: A systematic review. *PLoS Med* 4(10): 298. doi:10. 1371/journal.pmed.0040298.

V. RECOMMENDATIONS

There are several reasons why this may be an opportune time for starting up a country-wide improvement collaborative in Cote d'Ivoire. First, the generally good basic care provided to patients at the first consultation suggests that providers generally know basic standards of HIV care—at least for the first visit. The fact that adherence to the same standards deteriorates over the first year of care suggests that the challenges to quality care may not lie in training but in reorganization of care. Second, health facilities that were poorly staffed and inaccessible due to civil conflict have re-established or reinforced communications and relationships with HIV implementing partners and the MOH. In fact, providers at several remote sites were especially open to the assessment process and welcomed dialogue about quality of care issues. Finally, a collaborative approach to quality improvement would facilitate shared learning of local innovations in organization of care, which has already taken place.

We recommend four activities for the collaborative:

1) **Monitor a small number of quality indicators, making sure to include indicators that track longitudinal care**: While monitoring indicators is a standard collaborative activity, it was apparent from the baseline assessment that in the complexity of HIV/AIDS care systems, big picture objectives may have been lost in the myriad of care activities. The results of the PMTCT cohort assessment in Figure 16 were particularly striking. Defining indicators of quality of care is another way of prioritizing what care actions are performed. For instance, downstream interventions in the PMTCT cascade of care (Figure 16) have far less chance of making an impact if interventions upstream are not taking place. Tracking key PMTCT indicators can help providers prioritize where to invest their energy for improvement activities.
2) **Improve documentation and information systems for more efficient information retrieval**: Better documentation would improve the quality of care immediately. First, currently undocumented activity, such as counseling, would become apparent as a result of reduced duplication of care. Second, improved documentation facilitates coordination of care, which is necessary to support efforts in task shifting and greater coordination of care between services. An improved information system would also allow users to efficiently track patient care longitudinally. The process of retrieving data for the PMTCT cohort was unnecessarily time-consuming. The information system would also need to ensure that forms are available when needed. Finally, we recommend that until the national medical record is widely adopted, standard record-keeping strategies be tested with the long-term objective of folding key best practices into care standards. These would include guidelines about how to track and document pre-ART patients, at what point to start and date a medical record for HIV patients, and how to organize records for efficient retrieval. Applying uniform standards of record-keeping would allow the health system to better track key points at which patients are lost to follow-up.
3) **Focus on addressing poor retention**: Once an HIV-positive patient has made contact with the HIV care system and received the initial lab tests, greater investment needs to be made to keep him or her in the system, including psychosocial support. If the HIV-positive patient does not stay in HIV care, the benefits to the patient or the community resulting from the investment in HIV screening are negligible. For public health considerations, low retention in ARV care is a tremendous cost, as well as a threat to ARV efficacy. Where possible, coordination of care with local NGOs and community resources may be the most realistic long-term strategy for retaining patients in the system. Because community-level HIV care already exists in Cote d'Ivoire, better care practices in efficient coordination between facilities and community groups can readily be identified.
4) **Promote shared learning of innovations in care, including task shifting experiences**: As noted elsewhere in this report, sites are already testing different models of task shifting and organization of care in health facilities. The collaborative approach is primed to collect and disseminate the best practices of these experiences.

APPENDIX: Quality of Care Assessment Sites

Site	Level of care	Number of tools completed, medical records reviewed, and interviews conducted					
		Provider interview	ART cohort	Pre-ART cohort	PMTCT	Patient interview	Laboratory
CHR SAN DEPRO	2	1	30	30	26	ND	ND
CMS SOGB	1	1	25	30	20	ND	ND
CSU BARDOT	1	1	19	30	10	ND	ND
PIM ABENGOUROU	1	1	30	30	ND	ND	ND
CAT ABENGOUROU	1	1	30	30	ND	ND	ND
SSSU ABENGOUROU	1	1	30	30	ND	ND	ND
PMI DIOULAKRO	1	1	ND	ND	9	ND	ND
CSU DAME AGNILEKRO	1	1	ND	ND	7	ND	ND
H G TANDA	1	1	13	30	6	ND	ND
CHR ABOISSO	2	1	30	12	16	ND	1
H G ANYAMAN	1	1	30	30	21	5	1
CNTS	3	1	28	29	ND	11	1
H M A	3	1	3O	9	ND	ND	ND
FSU TOIT ROUGE	1	1	28	3	20	ND	ND
SAPH TOUPAH	1	2	3	ND	ND	ND	1
HG Police Nationale	1	2	7	7	1	ND	1
YOP ATTIE CEPREF	1	1	30	24	20	10	1
HG SIKENSI	1	1	3	8			1
PMI BOUAFLE	1			ND	10	6	ND
CAT ADJAME	1	1	28	8	ND	ND	1
HG BONOUA	1	1	25	14	ND	7	1
PMI YAKRO	1	1	7	ND	1	4	ND
CAT DALOA	1	1	24	25	ND	6	ND
PIERE ANGULAIRE	1	1	30	30	ND	ND	ND
CLINIQUE CONFIANCE	1	2	29	30	ND	ND	ND
FSU COM NIANGON	1	1	30	20 +10	ND	ND	ND
CHR ADZOPE	2	1	28 +1	10	20	ND	ND
CHR AGBOVILLE	2	1	27	27	20	ND	ND
PMI ISSIA	1	1	ND	ND	20	10	ND
HG Oumé	1	1	18	19	18	ND	ND
Abobo Avocatier	1	1	30	29	0	14	1
IDE Afrique	1	1	0	0	0	ND	ND
CHR Odienné	2	1	22	0	5	ND	ND
CHR Man	2	1	33	23	20	ND	ND
CHR Dimbokro	2	1	25	28	14	ND	ND
HG Danané	1	1	27	30	20	ND	ND
HG Katiola	1	1	0	0	9	ND	ND
Maternité Koko-Ton	1	1	0	0	12	ND	ND

PMI Dimbokro	1	1	23	1	9	ND	ND
PMI Sokoura	1	1	0	0	7	ND	ND
Ste Camille	1	1	30	30	14	ND	ND
		46	803	668	355	73	11

ND = No data.

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