



Immunisation Data Quality Audit

GHANA

08th July – 23rd July 2002

Prepared by: The LATH Consortium*
On behalf of: Global Alliance for Vaccines and Immunisation (GAVI)
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1. Introduction

The Data Quality Audit (DQA) is part of the Global Alliance of Vaccines and Immunisation (GAVI) programme. It has been designed to assist the countries receiving GAVI support to improve the quality of their information systems for immunisation data. In addition, it calculates a measure of the accuracy of reporting, the country's 'verification factor' for reported DPT3 vaccinations given to children under one year of age (DPT3 <1). In 2002, the DQA is being performed in 16 countries. It is hoped that participation in the DQA will assist each country in understanding the extent and details of the audit while providing guidance on how the country's system for recording and reporting immunisation data can be improved. It is the explicit goal of the DQA to build capacities in the participating countries.

This DQA was undertaken in Ghana from 07th July to 23rd July 2002 by external auditors Ms. Sophie Le Brun and Mr. Per Milde and national auditors Dr. Agana Nsiire and Dr. McDamien Dedzo. The team worked at the national level of EPI before going to district and health facility levels (Health Unit – HU). Based on districts' reported DPT3<1 for the audit year at National level a random selection of four districts was carried out in advance. The following four districts were visited: Sekyere East in Ashanti Region, Tamale in Northern Region, Birim North in Eastern Region and Accra Metropolitan in Greater Accra Region. Six HUs plus one "reserve" HU were selected randomly based on reported DPT3<1 for the audit year at district level in Tamale and Birim North. Because total DPT3<1 was not available for HUs at district level, two Sub-Districts were selected randomly (also based on reported DPT3<1 for the audit year) at district level in Sekyere East and Accra Metropolitan districts, followed by a visit to the selected Sub-Districts. At selected Sub-District's level in Sekyere East all three reporting HUs, one in one Sub-District and two in the second Sub-District, were automatically qualified as HU. At selected Sub-District's level in Accra Metropolitan district all three reporting HUs were automatically qualified for the DQA in one Sub-District and three HUs were selected randomly based on reported DPT3<1 for the audit year in the second Sub-District. The "reserve" HU was to be visited only in the event that one of the first six was unreachable due to impassable roads. District information, for DQA normally found at National level, for the four selected districts was collected from the respective Regional offices. For Accra Metropolitan district Sub-Districts data were collected from the Regional office.

For Sekyere East district one Sub-District with one HU and one HU of a selected sub-district were identified as "Not Eligible" as the road to the Sub-District were impassable due to rain and the HU burned down including all records. The team verified this information. One selected HU's (Tamale Central) immunisation reports at district level were in reality a combined report from three facilities: one static clinic and two "satellite" clinics, each of the three facilities with its own monthly immunisation reports, Child Register and "tally" sheets/books. The team therefore collected data from all three facilities with the combined values used in the DQA as one HU.

For Accra Metro district one selected Sub-District, Okaikoi, in a metropolitan setting operates immunisation and other RCH services from 13 "zones" (or "satellite" clinics) each with a team of health workers immunising during "outreach-like" immunisation sessions in a number of areas. The Sub-District operates a total of two static clinics and 32 "outreaches" (also called "areas"), each "satellite" recording and reporting

individually to the Sub-District. The team selected randomly three “satellites” as HUs for the DQA.

A “movement curfew” (from 21.00 to 05.00) in Tamale district had no impact on the team’s work.

For each site visited (the National Office, 4 districts, and 21 Health Units) a summary analysis worksheet was created, which can be found in Annex b. Although it is still rainy season in Ghana all 21 selected HUs were visited and data collected, therefore, the team was not required to visit the “reserve” HU.

A debriefing meeting was held on 23rd of July with representatives from Ministry of Health, Ghana Health Service, UNICEF, WHO and other partners in EPI. The meeting was chaired by the Acting Director General, Ghana Health Service.

A comprehensive list of persons met during the DQA including the debriefing is included in Annex a of this report. Major recommendations/action points discussed during the debriefing included the following:

- Use of standard and pre-printed forms/formats at all levels. Especially for health facilities. Including registers, tally sheets/books, reporting formats.
- The issue of “vertical” programme recording and reporting: Been discussed for more than 20 years, now time for action. RCH/FP and EPI (and other programmes) to come together to agree on information needs (recording and reporting) at all levels, reporting deadlines, recording and reporting forms and formats to minimise workload for health workers at all levels especially health facility level, ensure data consistency and integrity. This will also involve partners, e.g. UNICEF and WHO (to accommodate their need for information in a practical and flexible manner).
- Denominators: Using correct definitions and factors and consistent data for all programmes.
- Developing practical guidelines for e.g. use of tally sheets/books (standard format, compilation, storing etc).
- Immunisation schedule: Vaccinators compliance and adherence to the EPI immunisation schedule as observed based on the DQA’s “Child Health Card” exercise demonstrated a need for special attention during supervision and refresher training sessions.

2. Background

Immunization data management structure

Ghana’s immunisation programme is managed and coordinated by the National EPI Manager reporting to the Head of Disease Control Unit, who reports to the Director of Public Health who reports to the Director General Ghana Health Services. A WHO sponsored data management officer supports the routine EPI programme. EPI Manager reports immunisation performance monthly to the local WHO office.

Districts are autonomous in planning and implementing their health programmes with regional and national level roles in policy formulation, overall planning, resource mobilisation, advocacy, supervision and monitoring. Funds allocated from national level to districts are sent directly to the districts with very little role or control at

regional level. EPI managers at all levels are responsible for planning and coordination of health programme activities including immunisation. MOH/GHS is in the process of refresher training of regional and district immunisation managers based on a newly developed set of “Mid-Level Management Courses (February 2002)”.

Vaccine management system

Vaccine supply is at national level the responsibility of EPI Manager and at regional level of the Cold Chain Manager who reports to the Senior Medical Officer (Public Health) (SMO (PH)). The district Disease Control Officer (DDCO) is responsible for vaccine supply and cold chain management in the district. AD syringes, safety boxes and other commodities are supplied through the Central Medical Stores, Regional Medical Stores and District Medical Stores.

Ghana introduced the combined DPT-Hep B-Hib (HH) vaccine from January 2002, having tested the change in a few districts first during the last months of 2001, including Accra Metropolitan district. The DQA collected therefore information for the HH3 and DPT3 where applicable.

Information flow

Two lines of information regarding immunizations were found at all levels (EPI and RCH), but country's official information for immunisation relies on the EPI data, therefore the DQA also used this information source.

- The operational level is the health facility (Health Unit (HU)), which can be a Polyclinic (mostly in urban settings), a Health Centre, a RCH Centre/clinic, a hospital (with Maternity clinic, Child Health clinic or RCH clinic) or a Mission, NGO or privately operated clinic, or a Community-based Health Planning and services (CHPS) compound.

HUs report monthly to the sub-districts using a standard pre-printed EPI “Immunisation Monthly Return” form. Sub-districts compile and report monthly to the districts. Districts report to the regions, which compile and report to national level including districts' figures. In one visited district (i.e. Accra Metropolitan) the sub-districts reported directly to the region that then sent copies back to the district. This one district doesn't report monthly to the region. Some sub-districts include HUs reports in the monthly report to the district.

The “Immunisation Monthly Return” format was changed in mid 2001 to include separate reporting for TT for pregnant and non-pregnant women. A new form was introduced in 2002 to include the introduction of HH vaccine.

- HUs also report on a standard pre-printed form monthly to the sub-district RCHs, who report quarterly, half-yearly and annually to the district. Districts report to region and region to national level. This reporting system also contains some key immunisation indicators (BCG, OPV and DPT3 for children under one year of age).
- National level feedback, monitoring and reporting including annual report and “Joint Report Format” to WHO/UNICEF is generated by the EPI Manager based on the “Immunisation Monthly Return” reporting system.

Tools

HUs record immunisations on individual standard pre-printed “Road to Health Cards”, retained by the child/mother, and “TT Immunisation Cards” for pregnant women. A “Registrants/Attendance” register is used for recording individual child information based on RCH indicators and immunisations (=“Child Register”) at the HU. This register is not standard or pre-printed, but prepared at the HU. A standard EPI tally sheet in A3 format was officially in use during the audit year. However, due to the very large size most HUs found this impractical and also in short supply and therefore used “note books” or “note-pads” or “marking books” to tally immunisations and other RCH activities. EPI is in the process of introducing a new standard A4 size immunisation tally sheet in a book-form.

“Home-visits” are normally recorded and tallied by the HUs, whereas some mop-up immunisation sessions are recorded and reported as part of the routine immunisation activities, but the “tally” information not stored at the HUs.

This DQA is the first in Ghana.

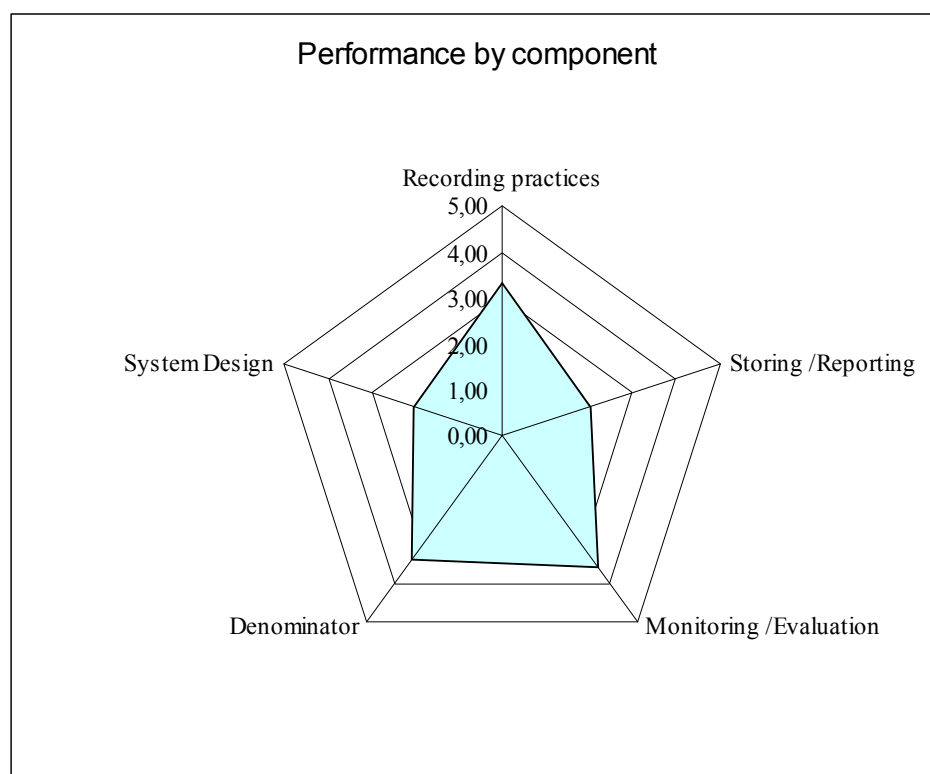
3. KEY FINDINGS

3.1 NATIONAL LEVEL

(see Annex b: the synthetic analysis worksheet).

Part of the DQA is a Quality Index based on, for national level, five components with a number of observations/issues per component. The DQA Quality Index for national level is: **59.1%**.

The individual components are shown in the following radar-graph:



Recording Practices:

- The EPI data management system seems to be functioning well with a high degree of accurate and consistent data with only a minor difference between reported DPT3<1 in JRF 2001, National tabulation and district tabulated figures. However, the system may be less robust than wanted in that processes, operations and data handling are not well documented with written procedures.
- It is desirable in a robust data management system to register the “time” (i.e. date) reports and other data information is received at various levels, which is not in practice in Ghana.
- The national vaccine ledger including monitoring of batch number and expiry date is of good standard.

Storing/Reporting:

- EPI data management is computerized. Lack of written procedures and guidelines for data handling between several computers used for EPI data management including identification of master files, timing of different file versions vis-à-vis generated reports and archived files as well as appropriate back-up procedures may put the system data integrity at risk. It is not quite clear if the roles of the EPI data manager officer and the WHO support function are well defined. It seems as if the WHO support function has become too focal for EPI data management.
- Different national figures for DPT3<1 for the audit year. Different figures although minor differences found in JFR 2001, recent national tabulation and recent district tabulation at national level as well as in the RCH annual report.
- Reports are well stored and filed at national level.

Monitoring/Evaluation:

- A monitoring method at EPI of reporting completeness and timeliness was recently introduced but the method used appears however not to be fully reliable and to give “half the picture” since the current system and practice does not include “date for report compilation” and/or “date for report signed” and “date for report received at national office”. Nor does the report include follow-up of completeness (i.e. have all regions reported all districts’ final data to national level).
- “Source of data trace ability”/ data trail/ Integrity of data : The aggregated data file used for e.g. JRF was not retrievable as EPI does not keep a “hard copy” and the computer file was not “archived”. The “timing” of the aggregated data file (i.e. the exact date/time the file was generated) is not a feature of EPI data management system. This is also illustrated by lack of “date for production” on various reports, tables, print-outs etc.
- Vaccine management includes good monitoring tools e.g. tables and graphs which are displayed.
- Similar charts or graphs were not seen for immunization performance.

Denominator:

- Denominators, or “targets”, for children below one year of age and pregnant women have been based on projected figures for national and regions based on the 1984 census with the census’ “de factor” value for children 0-11 months old, i.e. 4% for year 2000. Provisional results - population figures, annual growth rate and children 0-11 months proportion figure - from the 2000 census were used for 2001 and 2002, but recently revised for 2002 based on final results. EPI calculated “surviving infants” for JRF 2001 for DPT3<1 based on IMR (DHS 1998) and CBR (provisional 2000 results). The team is of the opinion that the denominators, as seen for 2000, 2001 and 2002 at national, regional and district levels are in-consistent and not based on appropriate definitions and values. E.g. using the “de-facto” percentage for children 0-11 months old (i.e. as found on census date) and pregnant women for DPT3<1 and TT2+ does not adhere to WHO definition of “surviving infants” or “estimated live births”.

- For 2001 the denominator was based on two times the annual growth rate and an incorrect preliminary provisional 2000 census results. It has not been possible for the team to match the denominator figures for 2001 and 2002 with calculations performed by the team based on valid figures.
- Some coverage rates seem to support the findings above as they were too high. Nine districts coverage rates for DPT3<1 for 2001 were above 100%. Many HUs' targets for 2001, which were based on the definition and calculation mentioned above, had been achieved in some cases up to twice the target.

System design:

- Immunization and other RCH/FP reported data are not integrated into one reporting system, but some key EPI data are reported in both systems. The two reporting systems have different reporting periods (monthly/quarterly) and reporting deadlines (last Thursday of the reporting month/ first week of the following month), which at HU level creates additional workload and gives room for confusion, human errors and thus problem with data management, system data integrity and consistency.
- Ghana is in the process of introducing AEFI reporting and monitoring.
- Although AD syringes, safety boxes and other relevant supplies are recorded at most levels as any other MOH commodity, a robust monitoring system is not in place. MOH/GHS is in the process of introducing such a monitoring system. These commodities are not supplied through the same channels as vaccine, which may create problems for appropriate monitoring and supply.

Performance Indicators:

Seven Performance Indicators are included in the DQA. The final table is shown below followed by specific comments to selected indicators:

Calendar year	Reported DTP3 <1	Change in reported DTP3 <1	DTP3 <1 coverage rate	%Districts DTP3 <1 coverage >= 80%	%dropout DTP1 <1 to DTP3 <1	%Districts dropout < 10%	%DTP vaccine system wastage	Quality of the System Index Score
2000	617 387		83,8%	69,1%	0,4%	77,3%		
2001	575 348	-42 039	76,2%	43,6%	5,9%	60,9%	1,2%	59,1%

Change in reported DTP3<1 (2000 to 2001):

- Due to vaccine shortage and countrywide and uneven availability of DPT vaccine

Drop-out DTP1<1 to DTP3<1 (2000 and 2001):

- A concern for the EPI. Addressed in workshops in mid-2001. Most likely: some reporting errors and a high emphasis on the national key indicator DPT3.

DTP3<1 coverage rate (2000 and 2001):

- Refer to the discussion above about "Denominator".
- Denominators for 2000 and 2001 were mistakenly calculated by annual growth rate twice and incorrect population figures.
- As a result, it is not possible for the team to make appropriate comments about this indicator.

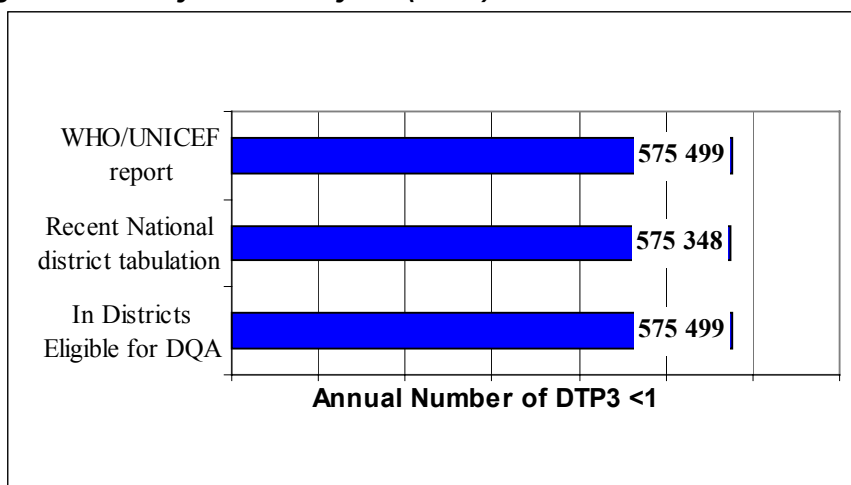
DPT vaccine system wastage (2001):

- Encouraging seeing a low wastage rate, which in this case stems from adjustment found at physical stock taking.

Completeness and timeliness of reporting from regions (here written as “Districts”) to national level:

Date on WHO /UNICEF report	Districts reporting rate to National Level	% Districts reports on time at National Level
19/06/2001	99,9%	0,0%
10/04/2002	99,8%	0,0%

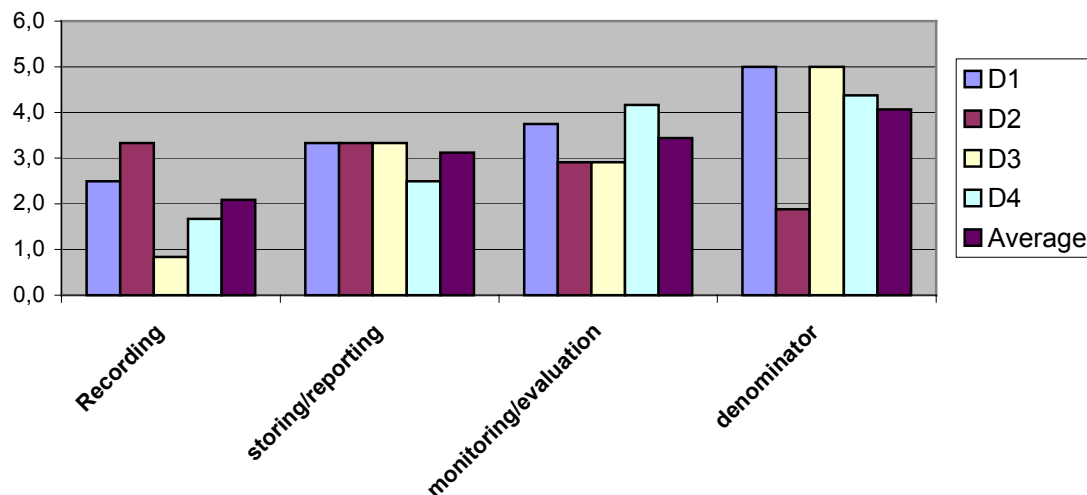
- The country is congratulated on this high reporting rate, which is also seen in the relative very high consistency of reported DTP3<1 between all levels.
- Timeliness indicator could not be calculated since the system does not record “date for report compiled/signed/sent” or “date for report received” vis-à-vis reporting deadlines. A perfect monitoring system would be based not only on reporting rate and timeliness but also on reporting “complete” and “accurate”.

Reporting consistency for Audit year (2001):

- Very minor difference between “Recent national district tabulation” and JRF (which is the same as the figure used for district sampling). 151 doses = 0.03%.
- An archive file for JRF’s reported figure was not retrievable. The difference is most likely due to a minor adjustment from human error with data entry identified after the JRF was finalized, which unfortunately can not be traced, as the computer files are not “archived” with “time=date+time” or hard-copy printed. This as mentioned before may result in inconsistent reported data and problems with provisional and final reported figures from regions.
- The RCH Annual Report for 2001 shows DTP3<1=578,733; a difference of 3,234 compared to JRF revealing inconsistency between two reporting systems.

3.2 DISTRICT LEVEL

(see Annex b: the synthetic analysis worksheets).



Recording: relatively low average score linked to several weaknesses in:

- Vaccine Ledger keeping: 2 districts out of 4 were missing, 1 didn't have complete entries for year 2001. Entries were not always up-to-date, almost no stock taking (physical count) nor discarded vials recorded. "Tally cards" were often used as ledger books. In some cases where the district didn't have its own cold room, no identified ledger book for the district could be found. Sometimes vials were recorded without mentioning the number of doses per vial, resulting in confusing balances and no wastage rate could actually be calculated.
- Handling of received reports: the reports processing was satisfactory in all the visited districts. However, the lack of (written) procedures to deal with late incoming reports, as well as the fact that receipt/ compilation dates were almost never recorded at both regional and district levels constitutes a risk factor for the integrity of the data (no "safety net" in case of dysfunctioning system).

Storing/reporting: homogeneous results for the 4 visited districts, rather good general performance

- The systems for submitting reports, as well as the filing were always satisfactory. If both archived and submitted reports were almost always signed, no compilation date could be found (not required by the standard format).
- In the absence of a real national system for monitoring the receipts / issues of injection supplies, the use of tally/ledger was scarce and not taken into account in the audit's result.
- Since data handling was not computerized the assessment didn't take into account computer practices. However -as a side note- the actual use of computers for monitoring purposes obviously lacks of back-up and sharing-data procedures.

Monitoring & Evaluation: rather good practices altogether

- The 4 districts were using targets for immunizations of both children and pregnant women.
- They also did provide regular feed-back to the lower level and had publications for year 2001 achievements. However, dates of publications/charts were never written.
- The existence of proper supervision schedules, (displayed) performance monitoring charts and completeness monitoring tables was variable among the visited districts and could still be improved;
- Written comments about supervision reports were absent.
- In the 4 selected district's health facilities, if the use of official reporting formats was systematic, the tallying methods were always heterogeneous (and scarcely official).
- No reporting system of AEFI could be observed (in process to be implemented nationally).

Denominator: average score of 4/5

- Catchment's area figures and population's profiles were provided by regional level and calculations were mostly correct (i.e. following the national policy). However the fact that 9 districts (nationally) presented a coverage higher than 100% in 2001 reflects some remaining concerns about the figures themselves.

Completeness/timeliness of reporting:

- Completeness of reporting was very good (100% in the 4 districts).
- Timeliness was generally declared satisfactory but could unfortunately not be calculated for reasons already mentioned (no available data)

Change in reported DPT3<1, coverage and drop-out rates:

	2001 Reported DPT3 <1	2000/2001 Change in reported DPT3 <1	% change	2001 DPT3 <1 coverage rate	% change	2000/2001 Denominator evolution*	2001 %dropout DPT1<1 to DPT3<1
Sekyere East	3627	180	(+5.2%)	72%	(+8%)	(-6%)	15%
Tamale	10273	1296	(+14.4%)	85%	(+11%)	(0%)	12%
Accra Metropolitan	48244	3598	(+8%)	70%	(+4%)	(+1%)	-2%
Birim North	4526	332	(+7.9%)	89%	(-9%)	(+18%)	25%
Nationally			(-6.8%)	76%	(-9%)	(+2.6%)	5.90%

(*2000 and 2001 denominators figures being the ones provided at the district and used for the respective years for calculating coverage rates)

- As for national data, interpretation of the figures remains difficult.
- Coverage rates are all above 70% and have mostly increased between 2000 and 2001. Apart from Birim North (who presents the best coverage), the drop out rates remain within acceptable limits. A slightly negative drop out is still observed in Accra Metropolitan.
- Change in reported DPT3 seems consistent in all the districts.

Annual DPT3 by source: for the 4 districts, good consistency (see charts in the annex b)

3.3 HEALTH UNIT LEVEL

(see Annex b: the synthetic analysis worksheets).

Use of registration cards, tally sheets and other primary records used for EPI:

- “Road to Health Cards”: proper format in use in all the HU visited
- “Child Registers”: registrants and follow-up/attendance registers are generally well used. Their format is not standardized.
- Tally notepads /marking books/tally sheets: different formats mostly produced at the health facility, with various tallying practices. Often the tallying was done simultaneously in notebooks and on tally sheets. Sometimes tallies were made on tally books on outreaches and mop-ups, and later transferred into the official tally sheets. Some tallies were done in pencil. In some tally books, the vaccinations were not separated into under and above 1year age groups.
- TT immunization registers: used in most places
- TT2+ tally books were not always in use/available (some were still only recording TT information)

Recording:

- Vaccine Ledger: often missing for year 2001, they are now used in most health facilities. They do not follow a standard format (“tally sheets” or manual formats) and are often misused (incomplete entries, no stock taking, often no record for borrowing/lending of vaccine among health facilities, recorded in vials without mentioning the number of doses per vials). As a result, almost no wastage rate could actually be calculated. Considering the introduction of new expensive vaccines, it becomes critical to enhance good practices in regard to stock keeping. The lack of record of batch number/expiry dates in the ledger is often balanced by the use of a monitoring table pasted on the refrigerator.
- As mentioned, the use of tally-books and registers is general and some measures are already taken to improve the tallying tools.
- An assessment of the vaccination schedule was also conducted (either through a little exercise or the observation of a vaccination session). The output was almost everywhere too low (missed opportunities to immunize, lack of attention given to the last visit’s or birth dates) resulting in inefficient immunizations. As a side note, some inaccuracies were noticed while reading the registers (confirming the former statement). The visited facilities almost never displayed any poster on vaccination schedule were found at.

Storing/reporting:

- The systems for submitting reports, as well as the filing were mostly satisfactory. Almost all the 2001 data required for the audit were available (reports and tallies) and only vaccine ledger book records were generally deficient.
- The submitted reports were usually well signed, but no date was written on them (compilation nor signed date)
- Reporting of RCH and EPI data with different deadlines (one being before the end of the month) results in double workload for all the health facilities as well as a threat to the integrity of the data.
- As a side note, confusion was often noticed in the labeling of the reports for health facilities that were also sub-district’s head (same name given for the 2 reports) resulting in inaccuracy of the reported data at district level.

Monitoring & Evaluation:

- Operational targets are set for most of the sub-districts. However, since the catchment's population per Health facilities is not available, the staff usually doesn't monitor its performance at this level. However, community registers appears to be a useful tool to get information about newborn children (registration, follow-up visits).
- The use (and display) of monitoring charts was infrequent, often due to lack of knowledge and skills of the staff.
- The lack of supervision's reports (and sometimes the lack of supervision itself), as well as the lack of feedback notes from upper level is a general finding.

Completeness/timeliness of reporting:

- Fairly good completeness usually observed.
- Timeliness could not be assessed (though it seemed fairly good according to the respondents) since the receipt dates were not recorded at the upper level (district/ sub-district).

3.4 VACCINE AND INJECTION SAFETY**Vaccine wastage**

"Immunization Monthly Returns" reports at all levels (HU, sub-district, district and region) contain data on vaccine wastage for all antigens: number of vials used for 2, 10 or 20 doses vials, total doses used and wastage rate calculated. Sub-districts, districts and regions compile the wastage for all reporting units for their monthly report.

At national level the "global" wastage rate is calculated monthly for regional and national level (see annex c enclosed table for 2001). The wastage rate for DPT vaccine for 2001 was 19.7% (as also reported in JRF). This monitoring system is based on accurate, complete and timely reports from HUs and compilation at next higher level. The system can provide very accurate figures about "global" wastage. The DQA did not assess this vaccine wastage reporting and monitoring system, nor did the team have time to register any data from the system. The team did notice that feedback to the regions from national level, both annual report and monthly feedback, contains an analysis and discussion about vaccine wastage. Also at district level an analysis and discussion of vaccine wastage is routinely part of the supervision system and monthly meetings with sub-districts and HUs.

The DQA's vaccine wastage indicator is based on data from vaccine stock ledgers, which is a more likely country source of information. Vaccine ledgers can also provide information about both "system" and "administered" wastage, i.e. wastage of un-opened vials (system wastage) and wastage of opened vials (administered wastage). This breakdown is important to provide managers information about total wastage ("global" wastage), wastage contributed from discarded vials due to expired, damaged (exposure to heat or frost, broken etc.) and missing inventory. DQA therefore calculates system wastage rate for DPT vaccine only at national and district levels based on vaccine ledgers. Doses administered is (normally) not recorded in vaccine ledgers. At HU level the vaccine ledger or stock control/monitoring ledger/register will have information about vials opened and doses used in total, which gives the global wastage.

- The vaccine stock ledger at national level was complete for the audit year. The DPT vaccine system wastage rate for 2001 is: 1.2% (due to missing inventory). This is an encouraging low national vaccine store system wastage rate. It is recommended to pursue the monitoring of vaccine wastage in order to bring it even further down.
- Vaccine ledgers for the four selected districts were either incomplete due to poor record keeping (missing information, mixing vials with different sizes together which gives wrong balance and therefore wrong records) or not used (because the district does not have a separate vaccine stock but mixed with regional vaccine stock without separate district stock ledger). The DQA could not calculate system vaccine wastage for any of the districts.
- Of the selected and visited 21 HUs only two HUs had complete vaccine stock ledger/register for the audit year. 19 HUs were either not using a vaccine stock ledger/register (not used at all, vaccine supplied from sub-district's stock) or using the ledger in-correctly (mixing vials with different sizes, in-correct record keeping). Only one of the two HUs global vaccine wastage is complete in this DQA (all reports from the audit year available and all DPT vaccinations registered in the DQA worksheet). The global vaccine wastage rate for this HU for the audit year is 3.5%. Which is a very encouraging low wastage rate. Although all reports from the audit year were available in the second HU, time did not allow the team to register DPT1, DPT2 and DPT3>1 vaccinations, without which a global wastage rate can not be calculated. The figure shown in the HU's "Analysis worksheet ("HU6 Anal(3)") is therefore not relevant.

Injection safety and "Adverse Events Following Immunization (AEFI)":

As mentioned above Ghana is in the process of implementing a national policy and system for monitoring injection safety issues and AEFI recording and reporting. The draft policy document ("Strategic Plan of Action for Injection Safety Of EPI, 2002-2006" (enclosed as annex d) presented to the team contains specific policies and guidelines for monitoring injection safety supplies and AEFI recording and reporting. EPI Manager informed the team, that initial meetings and workshops have been held, and a training and implementation programme was already started in some regions.

The DQA noted that only AD syringes are used in all HUs visited as well as safety boxes. Safety boxes are mostly burnt at the HU in accordance with current policy. AD syringes and safety boxes are supplied in a different supply chain to that of vaccine (from Central Medical Stores-RMS-DMS) and monitored with stock ledger etc. as a "normal" commodity (receipts-issues etc).

3.5 DATA ACCURACY

The verification factor is the ratio between the DPT3<1 recounted from tally sheets, "tally note-books", "tally note-pads" or "Child Register" at the selected, visited HUs during the DQA and the figures reported in the monthly reports: recounts/ reported. The verification factor for Ghana DQA is: **0.872**.

As mentioned above, most HUs visited used "private" non-standard and not pre-printed "note-books" as "tally sheets" for 2001, even to this day. Storing practices of reports etc. at HU level is of a high standard, which is illustrated by the high score of "all HU's reports available for the entire audit year", which was the case for 16 HUs (=76.2%). Only few monthly reports were missing in total. For "all HU's tally sheets available for the entire audit year" the score is: 61.9%. This score is higher if we look

at “available tally sheets”. This score is relatively high considering the practice of using “private” “tally note-books”, which may not be regarded as “official” and appropriate EPI tally-sheet.

It is clear some tally sheets are missing, and therefore the recounted value goes down. It was also clear that human errors play a role. The team noted some transcription errors, errors in compilation of monthly figures, some errors with reported figures for the reporting period, which often was a “broken” month e.g. reports compiled on the last Thursday of the month or “from 21st of the month” in order to meet reporting deadline of 25th or 28th of the month. Tally figures from e.g. a “satellite” clinic held after the monthly compilation would sometimes seem to be “missed out” by not being transferred from the “satellite” note-book to the main notebook. Mop-ups were included in reported figures, but not in tally sheets/”tally register/note-book”.

The team looked at consistency between reported figures from HU to Sub-District, from Sub-District to district, from district to region and from region to national level. For Accra Metropolitan district (which constitutes 72.45 % of the DQA’s selected districts’ reported DPT3<1 at national level as used in VF) an analysis of the reported figures from the selected two Sub-Districts constituting 45.76% of the district’s total reported figure shows a consistency of reported DPT3<1 from HU level to national level of >95%. Three out of six HUs in Accra Metropolitan could retrieve “tally sheets” for the entire audit year. “Missing” tally sheets from the remaining three HUs, is the reason why the “VF” for this “large” contributor in the DQA’s VF is “low” (0.835).

At Tamale district the consistency of reported DPT3<1 is less good. Recounted DPT3<1 is larger than reported figures from three HUs:

DPT3<1 (2001)	HU1	HU2	HU3
District tabulated	5,272	1,231	1,124
HU reports at dist	4,456	1,265	1,199
Nos. HU reports	11	12	12
HU reports at HU	5,635	1,260	1,213
Nos. HU reports	12	12	12
Reported HU VF	4,803	1,265	1,199
Recounted HU	6,266	1,352	1,317
Recounted/Reported	1.305	1.069	1.098

Tamale districts figures for DPT3<1 for 2001 are:

	DPT3<1 2001
National Tabulation	10,201
District reports at National	10,175
District reports at district	10,225
District tabulation	10,273
HUs used in sampling HU	10,533
Total HU reported for VF	9,419
Total HU recounted for VF	10,972
Recounted HU/Reported HU	1.165

The tables clearly illustrate inconsistency between reported figures at various levels (National, District and HUs), for which the team could not get a satisfactory explanation. However, the team feels that the most likely explanation is due to a mixture of transcription errors, which are supported by similar figures from other antigens primarily DPT1, errors with monthly compilation (see annex c copies of the

tally-book showing obvious compilation errors), problems with late-reporting and update of reported figures at district level and (some) under-reporting from HUs. Tamale district contributes to around 15.32% of the DQA (national tabulation). In one district some over-reporting was observed, which most likely was due to a mistake of figures between DPT<1 and DPT3<1, which was illustrated by checking recounted DPT1<1 and measles<1. This is more likely to happen if reports are compiled from non-standard non pre-printed forms.

The team did not see any signs of inflated reported figures or signs of “creative accounting”.

The VF confidence interval (0.527 – 1.217) is quite large. One reason for this is the sampling of two Sub-Districts in two selected districts with subsequently two instead of three strata per district. Another reason is the total of 21 HUs included in the DQA instead of 24 as the desirable number.

4. RECOMMENDATIONS

“If you can’t measure it, you can’t manage it”

(Eli Goldratt, “The Goal”)

Recording practices:

- Revisit the guidelines and policy for reporting deadlines comprehensively including both RCH/FP and EPI reporting needs.
- Develop in a participatory process standard pre-printed registers for children’s registration and follow-up (RCH/FP and EPI indicators and reporting criteria) as well as for ANC (TT immunizations etc. for pregnant women).
- Discuss the need appropriate portable standard preprinted tally notebook/ notepads, to meet the demand for tallying at the ground level at various service delivery situations for both RCH/FP and EPI combined, e.g. at static clinics, at satellite sessions, at outreach sessions, at mop-up etc. It is important to use only one tally book for individual session (i.e. no transfer of tallies). Insert a page with guidelines on how it should be used and its introduction should be carefully introduced.
- Introduce standard pre-printed EPI vaccine ledger at district, Sub-District and HU levels (with appropriate orientation/training possibly as on-the-job training e.g. during supervisory visits). Record all vaccine movements (including receipts, issues, balances, stock taking, borrowing, lending, discarded) in doses, but also in vials, at these levels, and include appropriate monitoring of vaccine batch number and expiry dates. The ledger could also be used for appropriate monitoring of AD syringes, safety boxes and other EPI commodities. One vaccine ledger should be used for each “unit’s” stock, e.g. if a sub-district handles vaccine both for its sub-district store/stock and for one or more HUs one ledger should be used for the sub-district stock and one ledger for each HU’s stock with appropriate recording.
- Develop appropriate operational and procedure guidelines for recording immunization data at all levels including e.g. how to tally (use of “tally

character”).

- As general policy introduce use of “report received date” for various levels on all reports (preprinted forms with “space” for it).
- Through supervisory visits assess the level of HUs knowledge and use of EPI immunization schedule, and train HUs where applicable. (As part of the DQA a small exercise of correct use of the immunization schedule demonstrated a too low score for the involved staff. This means that the very first “recording” of correct immunization given may be wrong, not to mention that the child is given a wrong immunization at the time). The EPI immunization schedule “poster” was only seen in a few HUs.

Storing/Reporting:

- Develop appropriate operational and procedure guidelines for computerized data management at national, regional and district level if applicable e.g. back-up, master file manager, archiving, “time tracking”.
- Synchronize reporting deadlines between RCH/FP and EPI especially for the HU level.
- If possible integrate reporting systems (RCH/FP and EPI) at least for identical key indicators.
- Ensure appropriate distinctions in labeling of reports between sub-districts and health facilities for correct compilation of monthly data

Monitoring/Evaluation:

- Calculate realistic operational performance targets for each HU for EPI key indicators (children<1, TT2+ for pregnant women).
- For national, regional and district level calculate denominators using appropriate definitions (e.g. CBR, IMR, GR, populations, etc...).
- Introduce use of appropriate written feedback to HU and strengthen the present system at all levels. This should include feedback from regular reporting, regular meetings, supervision visits etc.
- Introduce “time tracking” for EPI data management (date/time on all computer files/print-outs, reports, archive files, tables/charts etc).
- Strengthen monitoring completeness and timeliness of reporting based on: report received, on time, complete. For national, regional, district and Sub-District level.
- Improve use of EPI monitoring charts for all levels for all antigens.

System design:

- Integrate reporting for RCH/FP and EPI for all levels as minimum for EPI indicators duplicated in both reporting systems.
- Introduce appropriate monitoring of AD syringes, safety boxes and other EPI injection safety commodities. This could be synchronized with introduction of standard EPI vaccine stock ledger for all levels. This should be based on the national policy for use of, supply of and monitoring of injection safety.
- Introduce recording and reporting of “adverse events” (AEFI) based on national policy. This should include recording and reporting of single cases at HU level, aggregate reporting at sub-district, district, regional and national level.

ANNEXES

- a. Key Informants (including those attending the debriefing)**
- b. Summary Worksheets (national, 4 districts and 21 HUs)**
- c. PowerPoint presentation from debriefing meeting**
- d. 2001 National Vaccine Wastage (source: MOH)
Example of compilation errors (source: one of the audited HU's marking book)**
- e. “Strategic Plan of Action for Injection Safety of EPI”**

Annexe a: Key Informants

Ghana	Date	National Level	Name	Position
* <i>Internal auditor</i>				
** <i>Local counterpart</i>				
<u>National Level</u>	08/07/2002	Ministry of Health	Dr George Amofah	Director PHD (GHS)
	08/07/2002	Ministry of Health	Dr Mercy Ahun	National EPI Manager
	08/07/2002	Ministry of Health	Dr S.O.Sackey	Head Disease Control
	08/07/2002	Ministry of Health	Dr McDamien Dedzo*	Senior Medical Officer (Public Health)
	08/07/2002	Ministry of Health	Dr Agana Nsiire*	Senior Medical Officer (Public Health)
	08/07/2002	Ministry of Health	Mr Stanley Diamenu	WHO NPO /EPI
	08/07/2002	Ministry of Health	Mr Francis Abotsi	Logistician -GHS
	08/07/2002	Ministry of Health	Mr John Mensah	STO Cold Chain Manager
	08/07/2002	Ministry of Health	Ms Cilian Amponsah	Secretary EPI
Technical feedback meeting	23/07/2002	Ministry of Health	Dr Mercy Ahun	National EPI Manager
	23/07/2002	Ministry of Health	Dr Agana Nsiire	SMO - PH (UER)
	23/07/2002	Ministry of Health	Dr Mc Damien Dedzo	SMO - PH (VR)
	23/07/2002	Ministry of Health	Dr Victor Ankrah	Project Officer, UNICEF
	23/07/2002	Ministry of Health	Francis Abotsi	EPI logistician
	23/07/2002	Ministry of Health	Abdul Aziz Abdulai	Assit. Coldchain Manager
	23/07/2002	Ministry of Health	Stanley Diamenu	WHO (NPO/EPI)
	23/07/2002	Ministry of Health	Dr Messeret Eshetu	WHO (EPI Epidemiologist Medical Officer)
Final meeting	23/07/2002	Ministry of Health	Dr Aljeii	Ag Director General
	23/07/2002	Ministry of Health	Dr George Amofah	Director PHD (GHS)
	23/07/2002	Ministry of Health	Dr Mercy Ahun	National EPI Manager
	23/07/2002	Ministry of Health	Dr Agana Nsiire	SMO - PH (UER)
	23/07/2002	Ministry of Health	Dr Mc Damien Dedzo	SMO - PH (VR)
	23/07/2002	Ministry of Health	Dr A.A. Arde Acqual	Accra Metropolitan Director of Health Services

	23/07/2002	Ministry of Health	Gabriel Etsey	Accra Metropolitan Disease Control Officer
	23/07/2002	Ministry of Health	Stanley Diamenu	WHO (NPO/EPI)
	23/07/2002	Ministry of Health	Dr L.Ahadzie	Head National Surveillance Unit GHS
	23/07/2002	Ministry of Health	Thomas Nielson	UNICEF
	23/07/2002	Ministry of Health	Matthew Dally	JICA
	23/07/2002	Ministry of Health	Dr J.K. Amsfel	GHS
	23/07/2002	Ministry of Health	Stephen Ntsua	RCH/GHS
	23/07/2002	Ministry of Health	Emporam Awlabi	GRCS Dep Health Coordinator
	23/07/2002	Ministry of Health	Charles Sagoe Moses	SMOC (PH) - GAR
	23/07/2002	Ministry of Health	A. Mary Sarpong	ADM, RHD
	23/07/2002	Ministry of Health	Rejoice Hutaku	RCH/GHS, ADH Pro Off
	23/07/2002	Ministry of Health	Dr Isabella Sagoe-Mores	Child Health Coordinatio
	23/07/2002	Ministry of Health	Yan Brabbey Mpiani	Head admin. Unit (HASS) GHS
	23/07/2002	Ministry of Health	Mrs Victoria Dako	Director Health Adm & Support Services GHS
	23/07/2002	Ministry of Health		Asst Codchain Manager EPI HQ
	23/07/2002	Ministry of Health	Evelyn Quaye	MACP Care and Support Co-ord
	23/07/2002	Ministry of Health	Francis Abotsi	DCU / EPI
	23/07/2002	Ministry of Health	Dr A.A. Arde- Acquah	Metro Director of Heath, ACCRA
	23/07/2002	Ministry of Health	Felix D.Yellu	Chief Pharmacist
	23/07/2002	Ministry of Health	C.Barneme	ICD
	23/07/2002	Ministry of Health	Dr TN Awua-Siow	ICD Ghana Health Service
	23/07/2002	Ministry of Health	Evelyn Lamptey	Basic II Accra
	23/07/2002	Ministry of Health	Dr Victoria Adabayeri	Rep Paediatric Society
<u>Ashanti Region</u>	09/07/2002	Ashanti Region	Mr Fobi Yaw	Regional EPI Coordinator
	09/07/2002	Ashanti Region	Mr Bren Yaw Douglas	Regional Disease control Officer
Sekyere East	09/07/2002	District	Dr George Mensah	District Director of Health Services
Sekyere East	09/07/2002	District	Mr Gabriel Danso**	District Disease control Officer
Sekyere East	09/07/2002	District	Mr Charles Ohene Badu	Administrator

Sekyere East	09/07/2002	District	Anna Adomako	District Public Health Nurse
Sekyere East	12/07/2002	Kumawu HC	Godwim Ampatey Akwobo	DCO - Kumawu HC
Sekyere East	12/07/2002	Kumawu HC	Rebecca Mosore	Nursing Officer
Sekyere East	12/07/2002	Kumawu HC	Joana Mensah	CHN
Sekyere East	12/07/2002	Kumawu HC	Theresa Sackey	Midwife
Sekyere East	12/07/2002	Dadease HC	Gladys Yeboah Kwateng	In charge
Sekyere East	12/07/2002	Banko HC	Joana Antwi	In charge
<u>Northern Region</u>	15/07/2002	Northern Region	Dr Sylvester Anemana	Regional Director of Health Services
	15/07/2002	Northern Region	Amina Seidu	EPI Co-ordinator
	15/07/2002	Northern Region	Zakariah Yakubu	Health Service Administrator
	15/07/2002	Northern Region	Kofi Opoku	Regional Health Service Administrator
	15/07/2002	Northern Region	Dr Andrew Seidu Korkor	SMO-PH
Tamale	15/07/2002	Tamale District Office	Dr John Abenyeri	Municipal Director of H/Services
Tamale	15/07/2002	Tamale District Office	Nyam J. Johnson**	Municipal Disease Control Officer
Tamale	15/07/2002	Tamale District Office	Sanatu Alhassan	FT Disease Control
Tamale	15/07/2002	Tamale District Office	Zakariah Abdul-Kassim	Technical Officer(CH)
Tamale	15/07/2002	Tamale District Office	Aisha Mahama	District PHN
Tamale	16/07/2002	Sanyerigu	Barimini Briamah	PCHN
Tamale	16/07/2002	Sanyerigu	Janet Chna	N/O (CMB)
Tamale	16/07/2002	Sanyerigu	Rose Akanko	N/O (CMB)
Tamale	16/07/2002	Sanyerigu	Mary Koomson	SCHN
Tamale	16/07/2002	Choggu	Albertina Ninnang	PH in charge
Tamale	16/07/2002	Choggu	Grace Attabeh	SRN
Tamale	16/07/2002	Choggu	Seraphina Fiiirter	Midwife
Tamale	16/07/2002	Choggu	Marcelline Dabuo	Midwife
Tamale	16/07/2002	Choggu	Florence Tanle	Midwife

Tamale	17/07/2002	Tamale Central	Faustina Dery	N/O (PH)
Tamale	17/07/2002	Tamale Central	Margaret Nmini	PNO (Pn)
Tamale	17/07/2002	Tamale Central	Lovell Fati Civant	
Tamale	17/07/2002	Tamale Central	Cecilia Dambadoh	
Tamale	17/07/2002	Tamale Central	Stephany Akanko	
Tamale	17/07/2002	Tamale Central	Saratu Ibrahim	
Tamale	17/07/2002	Tamale Central	Agnes Akorli	
Tamale	17/07/2002	Tamale Central	Nagisah Issaka	
Tamale	17/07/2002	Tamale Central	Genevieve Jimpetey	
Tamale	17/07/2002	Tamale Central	Rebecca Kennedy	
Tamale	17/07/2002	Tamale Central	Caroline Adagia	
Tamale	17/07/2002	Tamale Central	Chirstiana Tarter	
Tamale	17/07/2002	Builpella	Katumi O. Mahama	NO (CMB)
Tamale	17/07/2002	Builpella	Alice Sumani	NO (CMB)
Tamale	17/07/2002	Builpella	Monica Allasan	MA
Tamale	17/07/2002	Builpella	Evelyn O-Adjetey	NO (CMB)
Tamale	17/07/2002	Builpella	Margaret Natomah	NO (CMB)
Tamale	18/07/2002	Vittin	Cecilia Mahama	Sub-district Head N/O
Tamale	18/07/2002	Vittin	Zenabu Abu	Staff Midwife
Tamale	18/07/2002	Vittin	Comfort Adatura	Community Health Nurse
Tamale	18/07/2002	Mile 9	Juliana A. Issah	N/O (CMB)
<u>Eastern Region</u>	15/07/2002	Eastern Region	Mr Michael Adjabeng	Technical Off. (ACT.RDCO)
	15/07/2002	Eastern Region	Mr Thomas Azurago	STO
	15/07/2002	Eastern Region	Mr Joseph Abbey	SFT
	15/07/2002	Eastern Region	Ms Emelia Okai	Principal T.O. (RDCO)
Birim North	15/07/2002	Birim North District Office	Dr	District Director of Health Services
Birim North	15/07/2002	Birim North District Office	Mr Abdoul Rahamani**	District Disease Control Off. DDCO

Birim North	15/07/2002	Birim North District Office	Ms Mohammed Dahda	Field Technician (FT)
Birim North	15/07/2002	Birim North District Office	Ms Theresa Mensah	PHN
Birim North	15/07/2002	Birim North District Office	Ms Ernestina Agkare	FT
Birim North	15/07/2002	Birim North District Office	Ms Beatrice Oforiwana	Midwife-Superintendent
Birim North	18/07/2002	New Abirem	Ms Agartha Abora	CNO
Birim North	18/07/2002	New Abirem	Ms Beatrice Oforiwana	CNO
Birim North	18/07/2002	New Abirem	Ps Peace Ametsitsi	Midwife-Superintendent
Birim North	17/07/2002	Akokoasi	Ms Faustina Mensah	Midwife Supt
Birim North	17/07/2002	Akokoasi	Ms Janet Frimping	CHN
Birim North	17/07/2002	Adausena	Ms Akpene Agbemana	CHO (SCHN)
Birim North	15/07/2002	Afosu	Miss Ruth Amofa	SCHN
Birim North	16/07/2002	Akokoaso	Miss Veronica Otchere	SCHN
Birim North	16/07/2002	Akokoaso	Miss Cecilia Kumah	Staff Midwife
Birim North	16/07/2002	Brenase	Miss Rosaline Amaning	SCHN
Birim North	16/07/2002	Brenase	Mr Asante Sarpong	Sen. Ma- Subdistrict Brenase
Greater Accra Region	09/07/2002	Greater Accra Region	Dr Charles Sagde Moses	SMO-PH
	09/07/2002	Greater Accra Region	Mr Agudey Sika Martey	Regional DCO
	09/07/2002	Greater Accra Region	Mr Seth Acquaye	Field Technician
	09/07/2002	Greater Accra Region	Ms. Jean- Shirley Atibul	TO G II
Accra Metropolitan	09/07/2002	Accra Metropolitan District Office	Dr A.A. Arde Acquah	Metropolitan Director of Health
Accra Metropolitan	09/07/2002	Accra Metropolitan District Office	Mr Gabriel Etsey	Metropolitan DCO
Accra Metropolitan	09/07/2002	Accra Metropolitan District Office	Ms Rosemart Martel	PNO
Accra Metropolitan	09/07/2002	Ablekuma Sub-district	Ms Eva Riberio Laryea	PNO PH I/C
Accra Metropolitan	09/07/2002	Ablekuma Sub-district	Ms Ivy DBED	PNO PH 2nd I/C

Accra Metropolitan	09/07/2002	Ablekuma Sub-district	Ms Mercy Sagde	SNO PH
Accra Metropolitan	09/07/2002	Ablekuma Sub-district	Ms Juliana Okotan	SNO PH
Accra Metropolitan	09/07/2002	Ablekuma Sub-district	Ms Margaret Mensah	Principal Tech.Off. PH
Accra Metropolitan	09/07/2002	Ablekuma Sub-district	M Aggrey James	Principal TO-PH/Sub-Metro DCO
Accra Metropolitan	10/07/2002	Okaikoi Sub-district	Ms Juliana Lamptey	Principal Nursing Officer I/C
Accra Metropolitan	10/07/2002	Okaikoi Sub-district	Ms Emma Antwi	SNO-PH
Accra Metropolitan	10/07/2002	Okaikoi Sub-district	Ms Beatrice Mareo	SNO-PH
Accra Metropolitan	10/07/2002	Okaikoi Sub-district	Ms Agnes Kwakye	SNO-PH
Accra Metropolitan	10/07/2002	Okaikoi Sub-district	Mr Regina Armak	Senior Field Technician (Cold room)
Accra Metropolitan	11/07/2002	Korlebu	Miss Juliana Tetteh	Senior Officer - PH/IC
Accra Metropolitan	11/07/2002	Korlebu	Mr Ayi Armah	Disease Control Officer
Accra Metropolitan	11/07/2002	Korlebu	Miss Mercy Parku	NO Maternity
Accra Metropolitan	11/07/2002	Korlebu	Miss Martha Amaou Yakubu	NO Maternity
Accra Metropolitan	11/07/2002	Korlebu	Miss Rose Acquah	SNO - PH J/C-Child Health Clinic
Accra Metropolitan	11/07/2002	Mamprobi	Miss Mercy Nkansah	NO
Accra Metropolitan	11/07/2002	Mamprobi	Miss Christiana Tetteh	NO
Accra Metropolitan	11/07/2002	Mamprobi	Mrs Elizabeth Ankrah	NO
Accra Metropolitan	11/07/2002	Mamprobi	Miss Sarah Aryee	SCHN
Accra Metropolitan	11/07/2002	Mamprobi	Ms Cecila Nkumfo	NO
Accra Metropolitan	11/07/2002	Mamprobi	Ms Deborah Allotey	NO
Accra Metropolitan	11/07/2002	Mamprobi	Ms Gifty Mensah	NO
Accra Metropolitan	11/07/2002	Mamprobi	Ms Gloria Nyamekye	NO
Accra Metropolitan	11/07/2002	Mamprobi	Ms Gelicia Mensah	NO
Accra Metropolitan	11/07/2002	Mamprobi	Olivia Esihene	SCHN
Accra Metropolitan	11/07/2002	Mamprobi	Ms Doreen Williams	Staff Midwife
Accra Metropolitan	11/07/2002	Mamprobi	Ms Mercy Sagde	CNO
Accra Metropolitan	11/07/2002	Mamprobi	Esther Sackey	SCHN
Accra Metropolitan	11/07/2002	Mamprobi	Ivy Obed	PNO
Accra Metropolitan	11/07/2002	Mamprobi	Comfort Addo	SCHN
Accra Metropolitan	11/07/2002	Mamprobi	Harriet Allotey	SNO
Accra Metropolitan	11/07/2002	Mamprobi	Esther Baddoo	SCHN

Accra Metropolitan	11/07/2002	Mamprobi	Thliana Okotah	SNO
Accra Metropolitan	11/07/2002	Mamprobi	Esther Quaye	SCHN
Accra Metropolitan	11/07/2002	Mamprobi	Viltria Affutuji	PNO
Accra Metropolitan	11/07/2002	Mamprobi	Justina Gugan	CHN
Accra Metropolitan	11/07/2002	Mamprobi	Morgaret Adosoo	SCHN
Accra Metropolitan	11/07/2002	Mamprobi	Sarah Eshun	SCHN

Annexe b: Summary Worksheets (national, 4 districts and 21 HUs)

Ghana - Audit Year 2001

Start date of audit 08/07/2002

A. Performance Indicators - 2000 and 2001

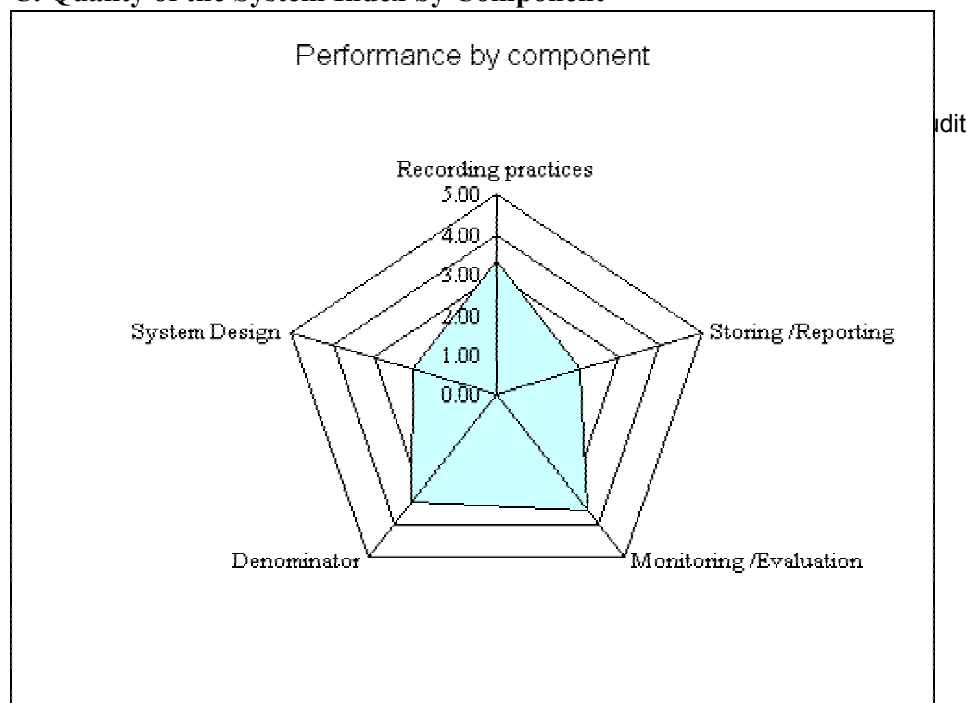
Calendar year	Reported DTP3 <1	Change in reported DTP3 <1	DTP3 <1 coverage rate	%Districts DTP3 <1 coverage >= 80%	%dropout DTP1 <1 to DTP3 <1	%Districts dropout < 10%	%DTP vaccine system wastage	Quality of the System Index Score
2000	617,387		83.8%	69.1%	0.4%	77.3%		
2001	575,348	-42,039	76.2%	43.6%	5.9%	60.9%	1.2%	59.1%

Based on most recent national totals

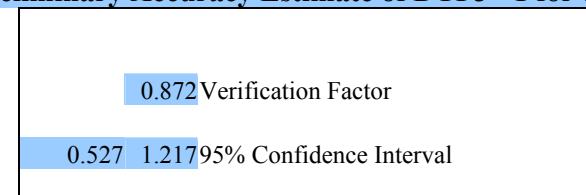
B. Completeness -2000 and 2001

Date on WHO /UNICEF report	Districts reporting rate to National Level	% Districts reports on time at National Level
19/06/2001	99.9%	0.0%
10/04/2002	99.8%	0.0%

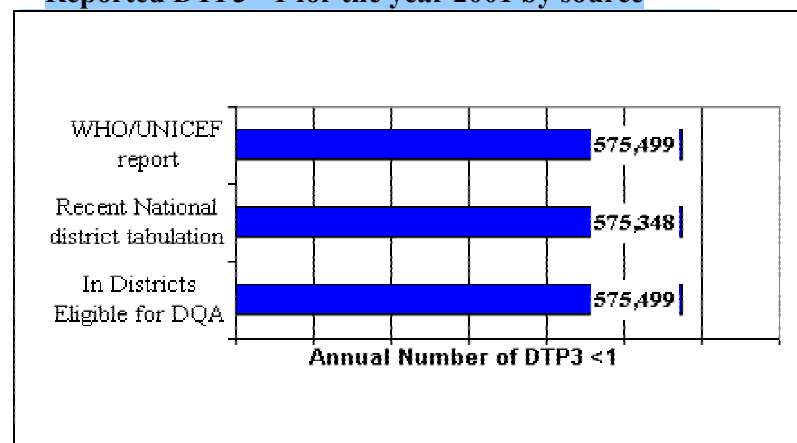
C. Quality of the System Index by Component



D. Preliminary Accuracy Estimate of DTP3 <1 for the year 2001



Reported DTP3 <1 for the year 2001 by source



Sekyere East - Audit Year 2001

Audit Date: 09/07/2002

A. Performance Indicators - 2000 and 2001

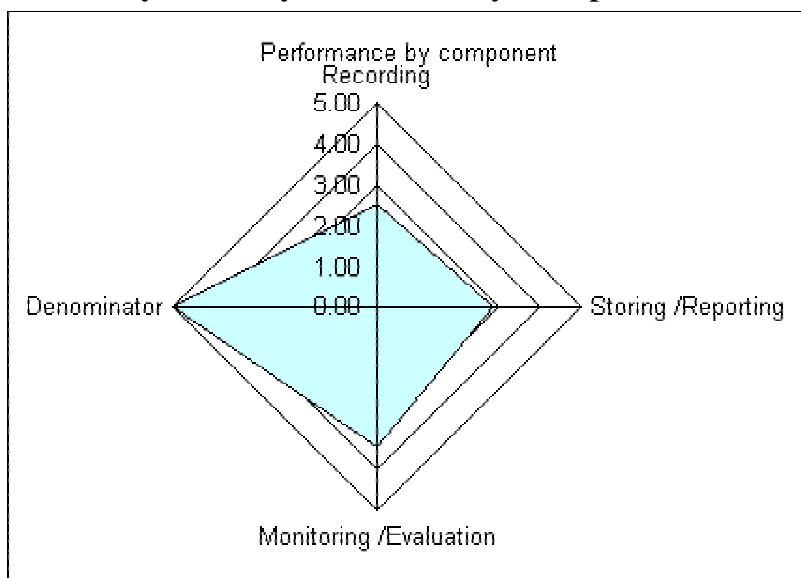
B. Completeness - 2001

Calendar year	Reported DTP3 <1	Change in reported DTP3 <1	DTP3 <1 coverage rate	%dropout DTP1<1 to DTP3<1	%DTP vaccine system wastage	Quality of System Index Score	National level		District level	
							% District's reports found at Nat. level	% District's reports on time at Nat.lev.	Nos. HUs reporting in audit year	% HU reports found at district level
2000	3,447		63.7%	0.0%						
2001	3,627	180	71.6%	14.9%	missing	70.6%	100.0%	0.0%	9	0.0%

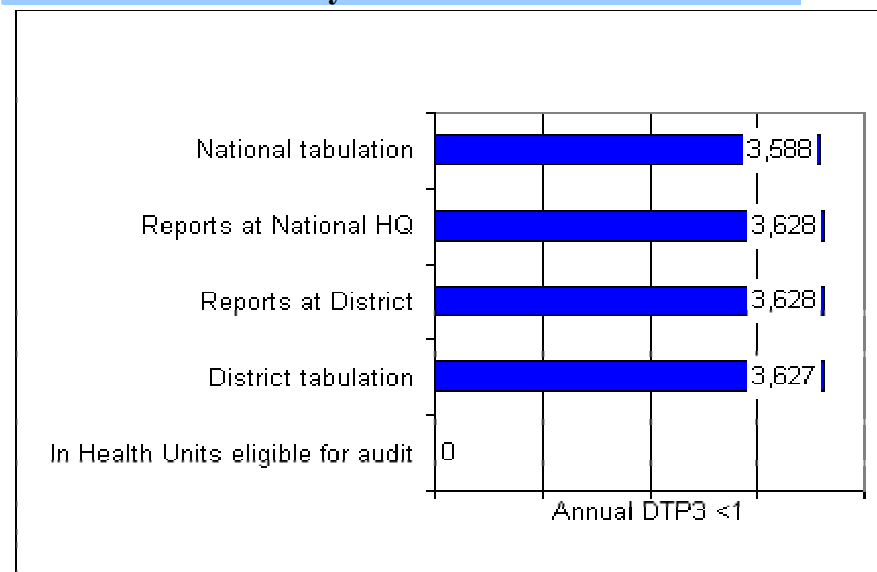
Based upon annual totals at District Office

Based on HUs included in HU sampling

C. Quality of the System Index by Component



D. Annual DTP3 <1 by Source for Year 2001



Kumawu HC, Sekyere East District - Audit Year 2001

Audit date: 12/07/2001

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
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2000	missing				
2001	403	missing	25.0%	missing	46.2%

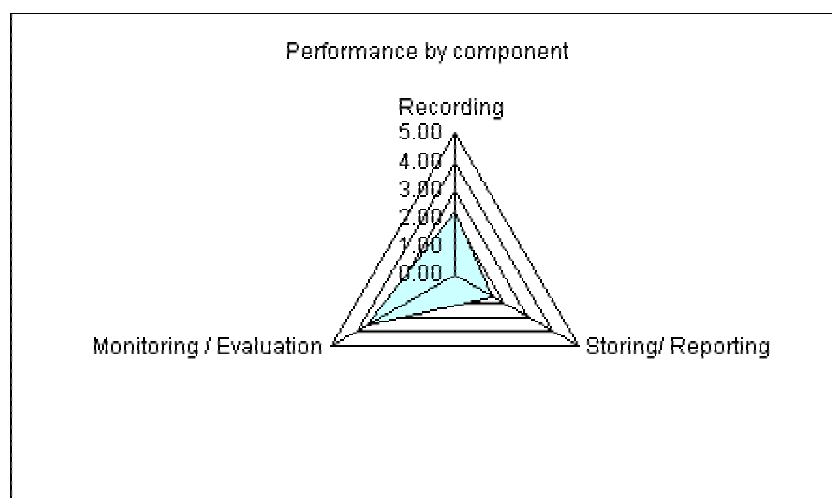
Based on information found at the Health Unit

B. Completeness for Year 2001

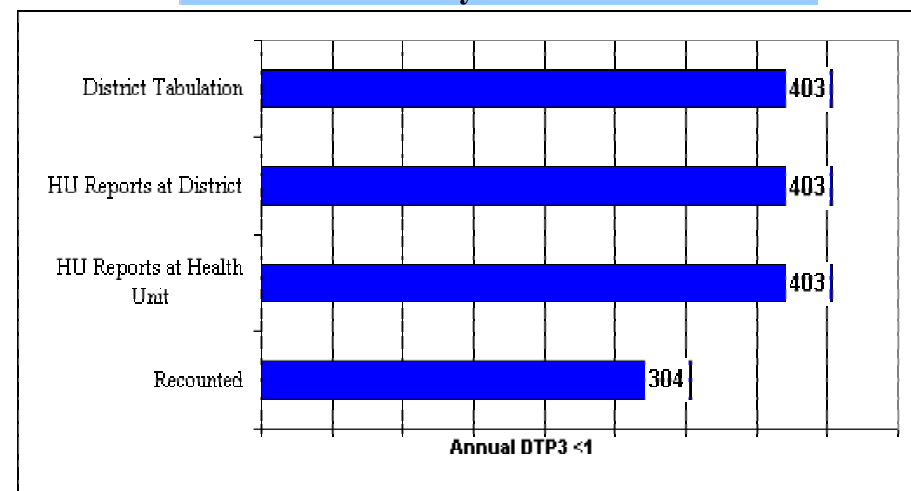
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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100.0%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Dadease HC, Sekyere East District - Audit Year 2001

Audit date: 12/07/2002

A. Performance Indicators - 2000 and 2001

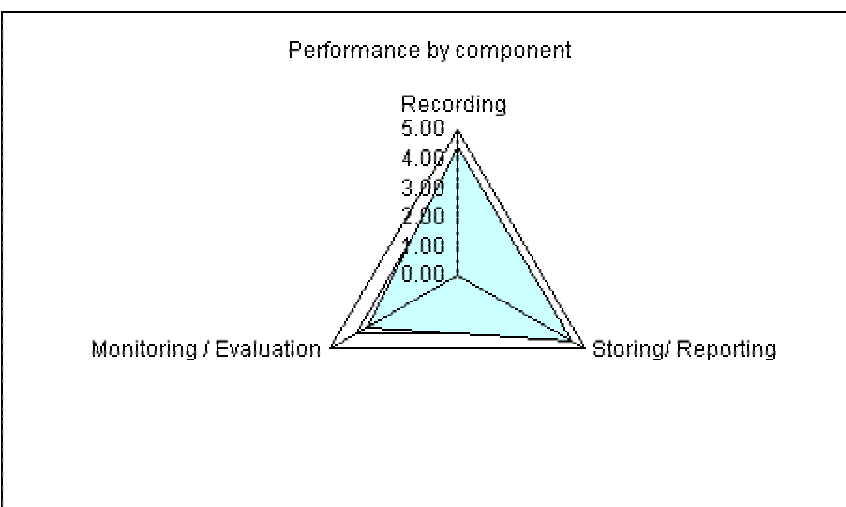
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	missing				
2001	351	missing	-0.6%	3.5%	84.6%

B. Completeness for Year 2001

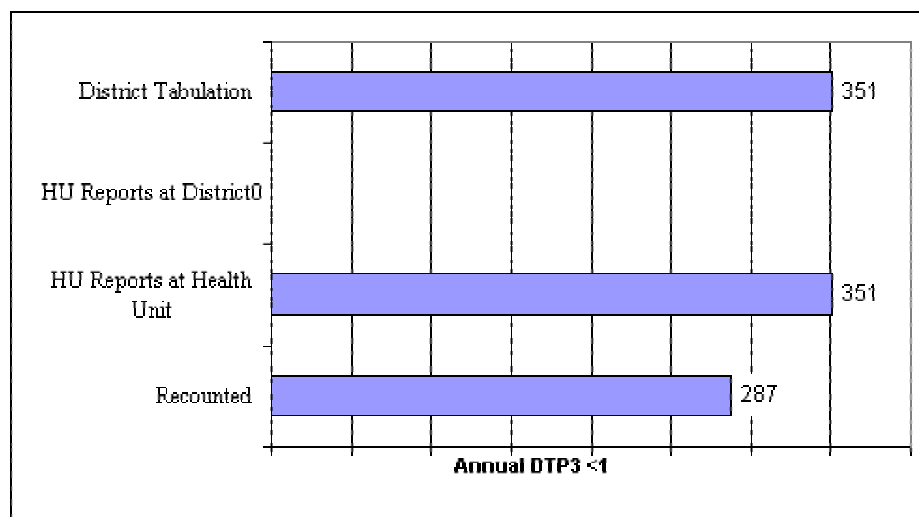
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
0.0%	0.0%	100.0%

Based on information found at the Health Unit

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Banko HC, Sekyere East District - Audit Year 2001

Audit date: 12/07/2002

A. Performance Indicators - 2000 and 2001

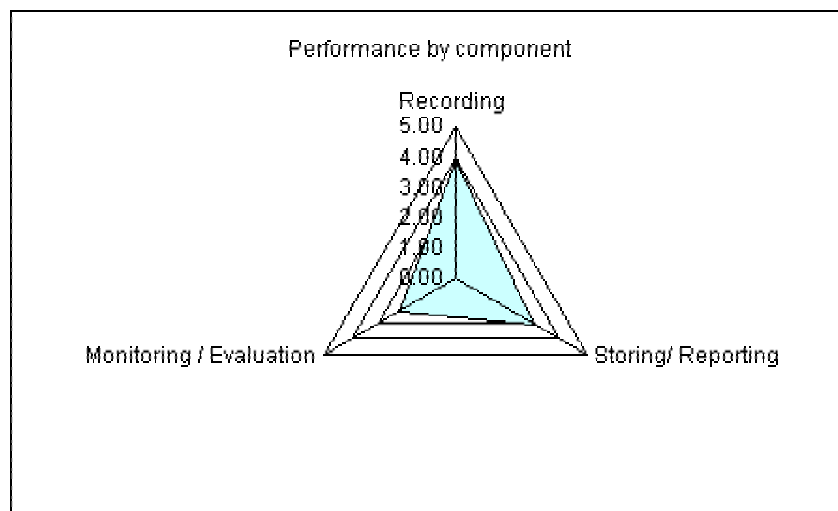
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	326				
2001	271	-55	4.2%	missing	61.5%

Based on information found at the Health Unit

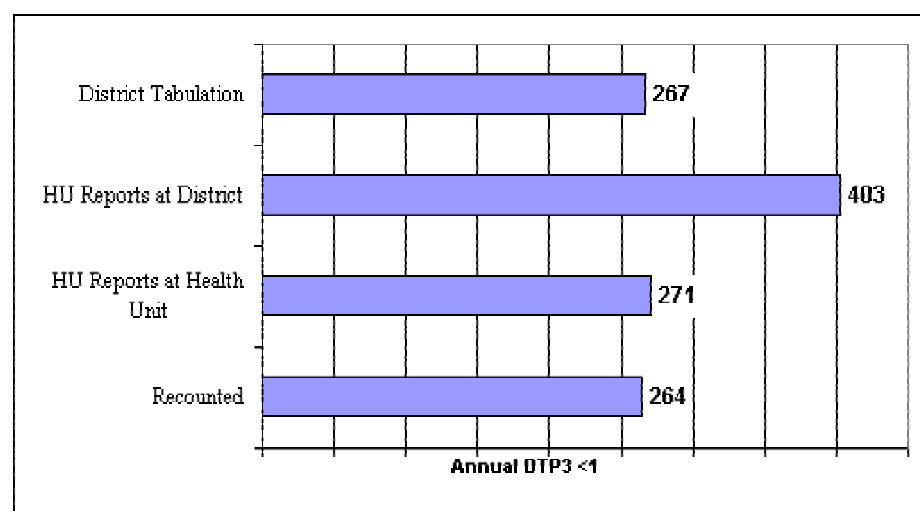
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Tamale - Audit Year 2001

Audit Date: 15/07/2002

A. Performance Indicators - 2000 and 2001

B. Completeness - 2001

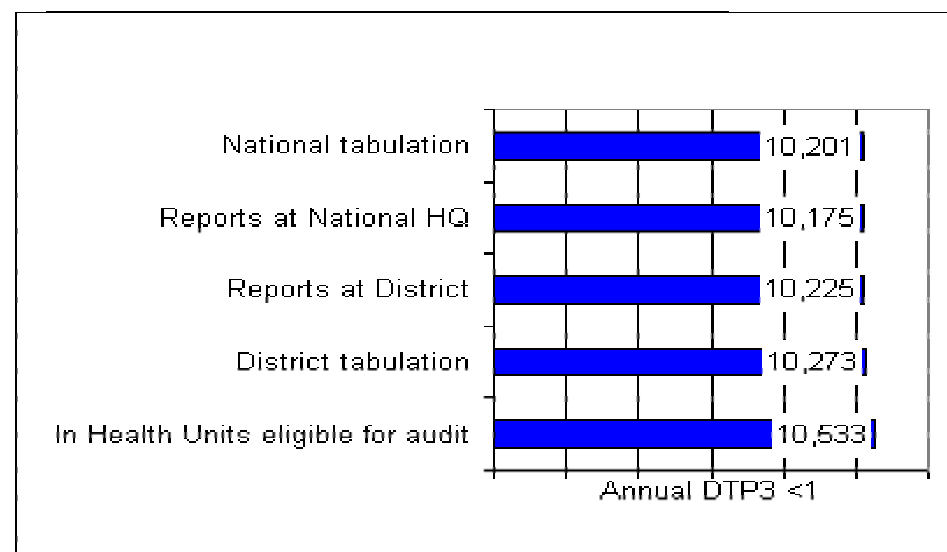
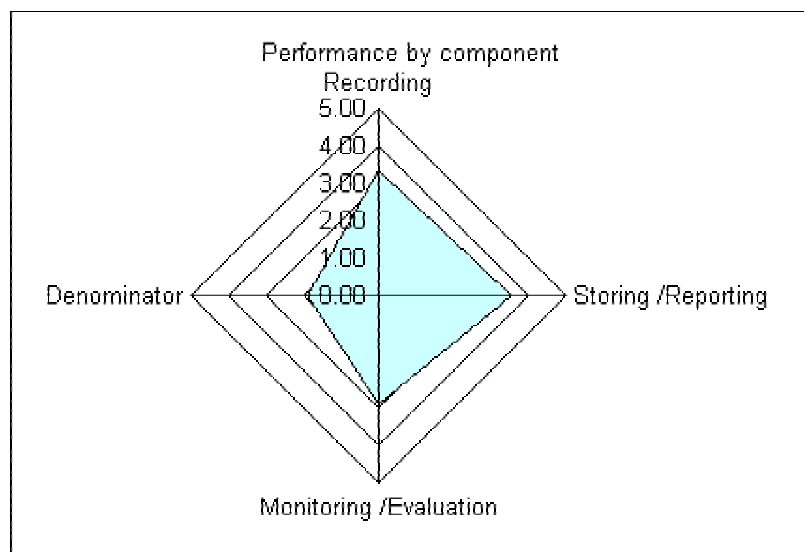
Calendar year	Reported DTP3 <1	Change in reported DTP3 <1	DTP3 <1 coverage rate	%dropout DTP1<1 to DTP3<1	%DTP vaccine system wastage	Quality of System Index Score	National level		District level	
							% District's reports found at Nat. level	% District's reports on time at Nat.lev.	Nos. HUs reporting in audit year	% HU reports found at district level
2000	8,977		74.6%	missing						
2001	10,273	1,296	85.3%	11.8%	missing	57.6%	100.0%	0.0%	8	0.0%

Based upon annual totals at District Office

Based on HUs included in HU sampling

C. Quality of the System Index by Component

D. Annual DTP3 <1 by Source for Year 2001



Tamale Central, Tamale District - Audit Year 2001

Audit date: 17/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	3,766				
2001	5,635	1,869	-4.0%	missing	67.9%

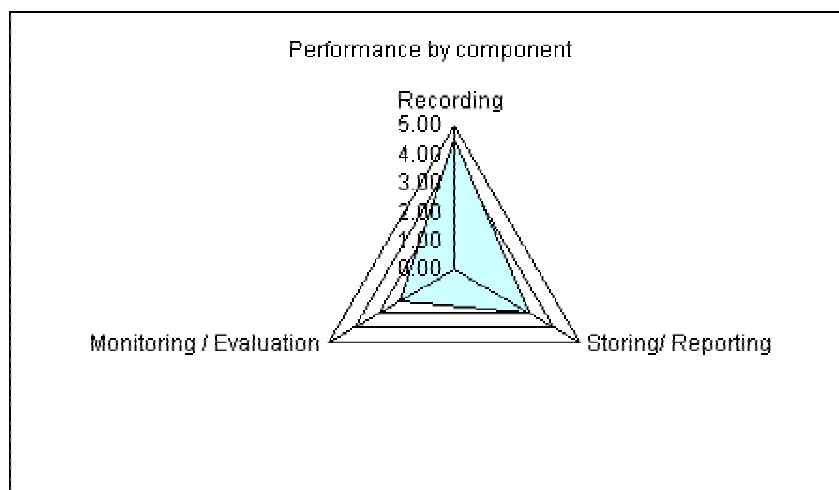
Based on information found at the Health Unit

B. Completeness for Year 2001

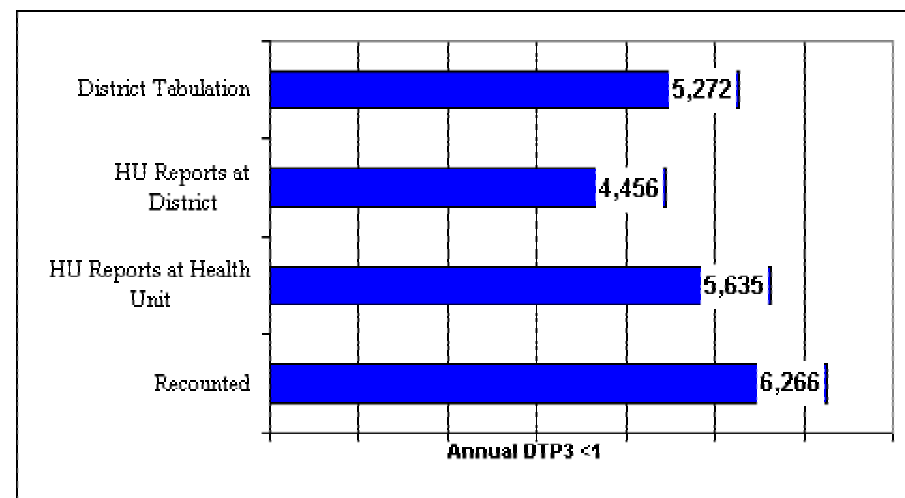
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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91.7%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Sagnerigu H/C, Tamale District - Audit Year 2001

Audit date: 16/07/2002

A. Performance Indicators - 2000 and 2001

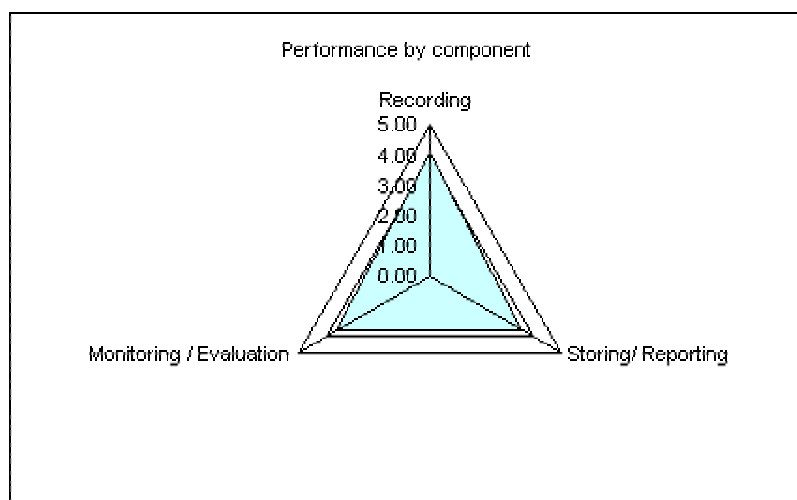
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	1,452				
2001	1,430	-22	4.0%	missing	75.0%

B. Completeness for Year 2001

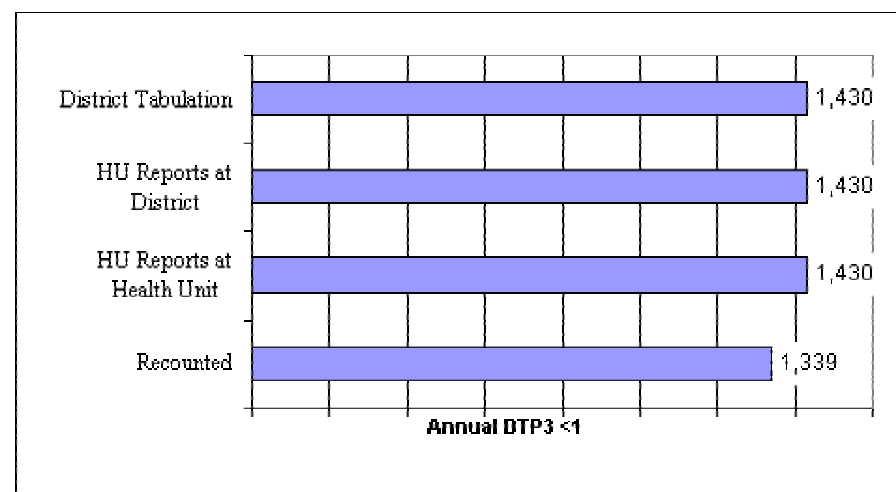
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

Based on information found at the Health Unit

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Choggu H/C, Tamale District - Audit Year 2001

Audit date: 16/07/2002

A. Performance Indicators - 2000 and 2001

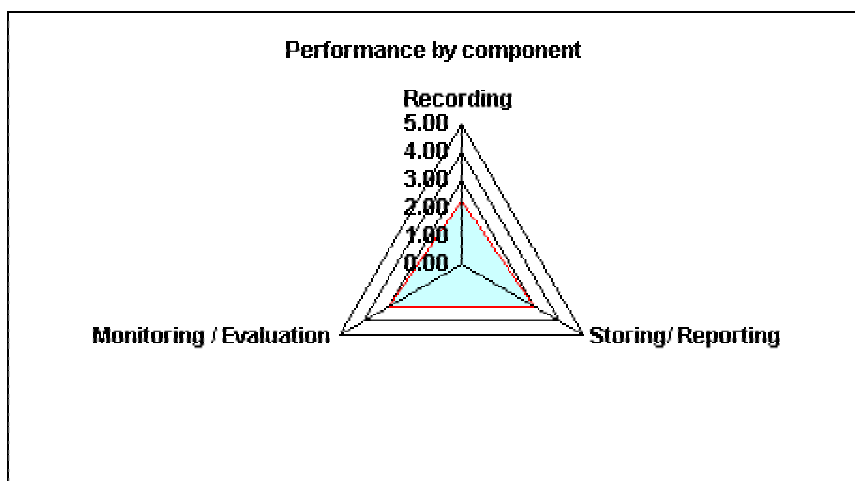
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	1,251				
2001	1,260	9	17.4%	missing	53.8%

B. Completeness for Year 2001

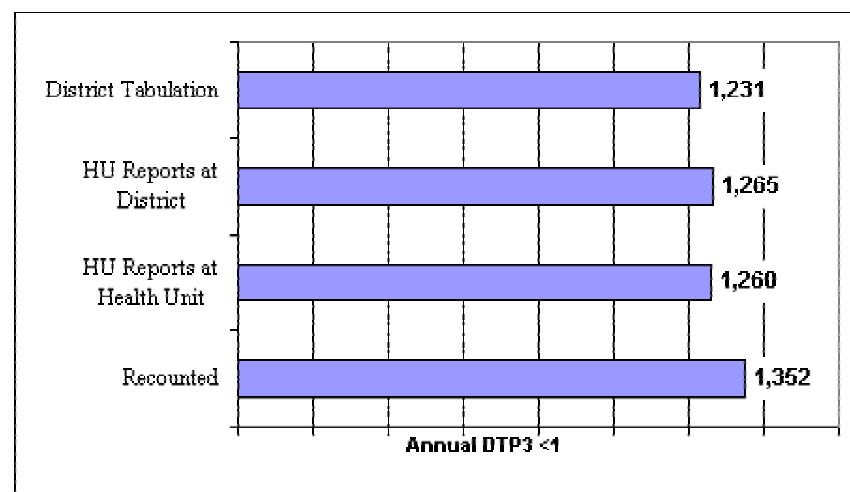
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

Based on information found at the Health Unit

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Bilpella H/C, Tamale District - Audit Year 2001

Audit date: 18/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	missing				
2001	1,213	missing	11.0%	missing	55.6%

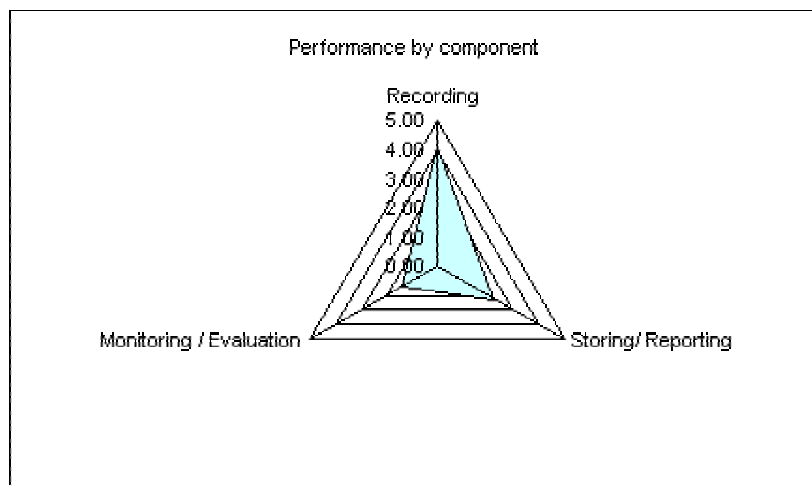
Based on information found at the Health Unit

B. Completeness for Year 2001

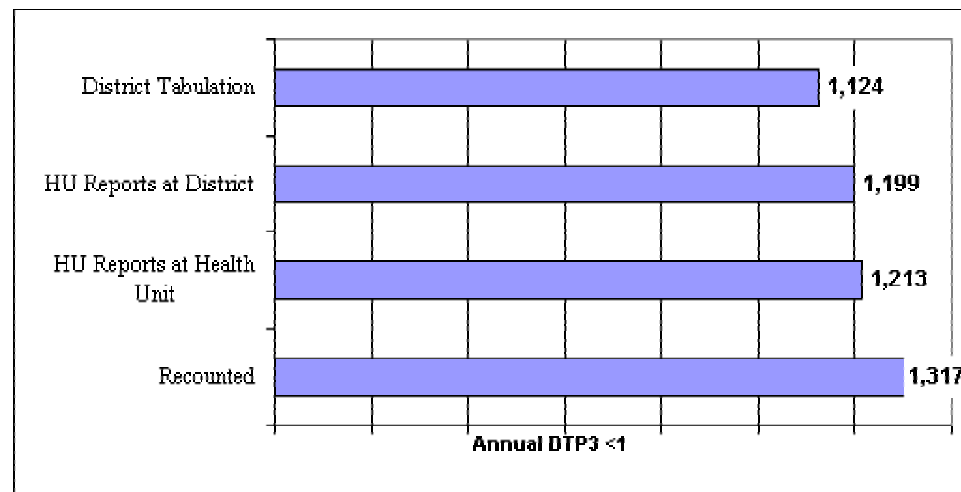
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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100.0%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Vittin, Tamale District - Audit Year 2001

Audit date: 17/07/2002

A. Performance Indicators - 2000 and 2001

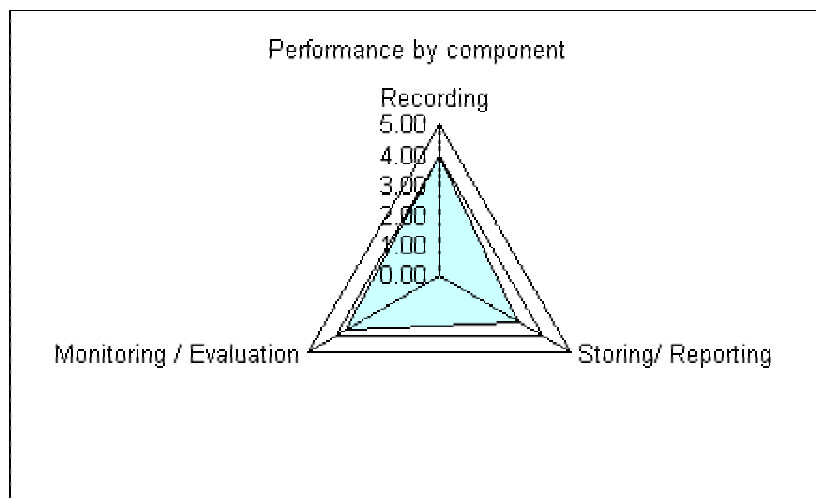
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	465				
2001	625	160	17.8%	missing	71.0%

Based on information found at the Health Unit

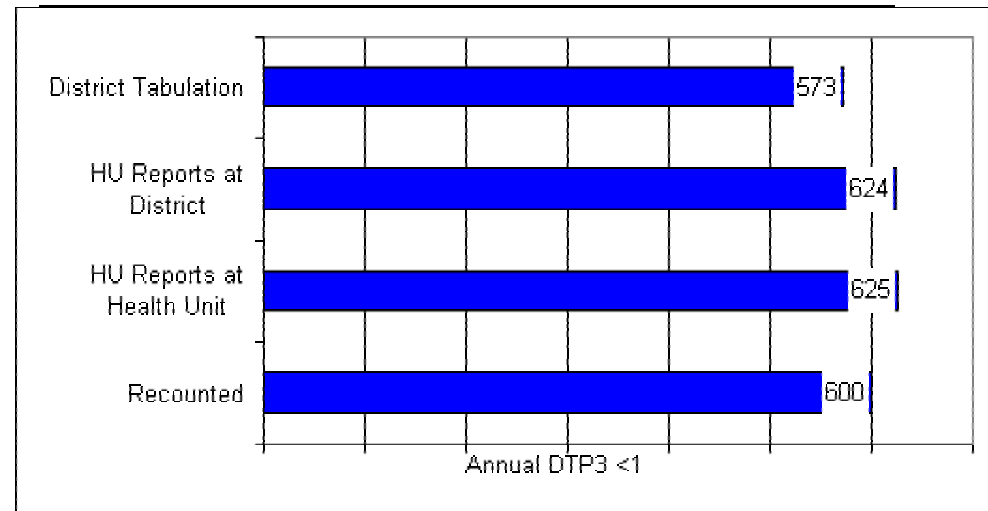
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Mile 9, Tamale District - Audit Year 2001

Audit date: 15/07/2002

A. Performance Indicators - 2000 and 2001

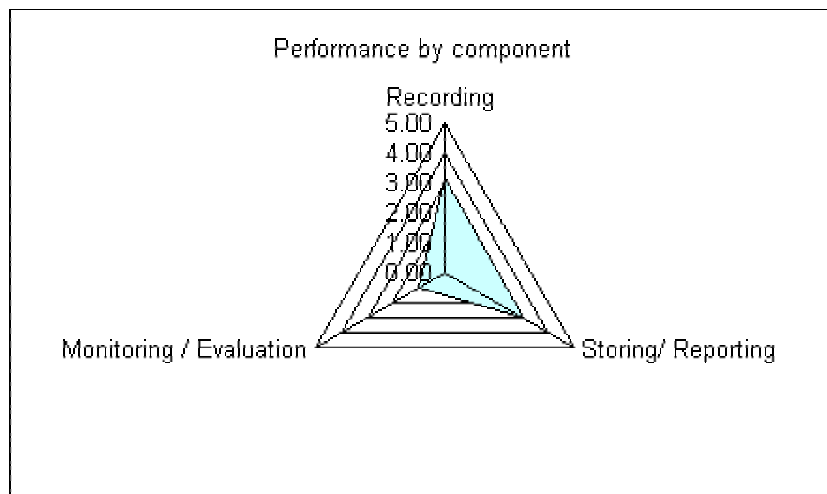
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	221				
2001	98	-123	76.1%	missing	53.8%

Based on information found at the Health Unit

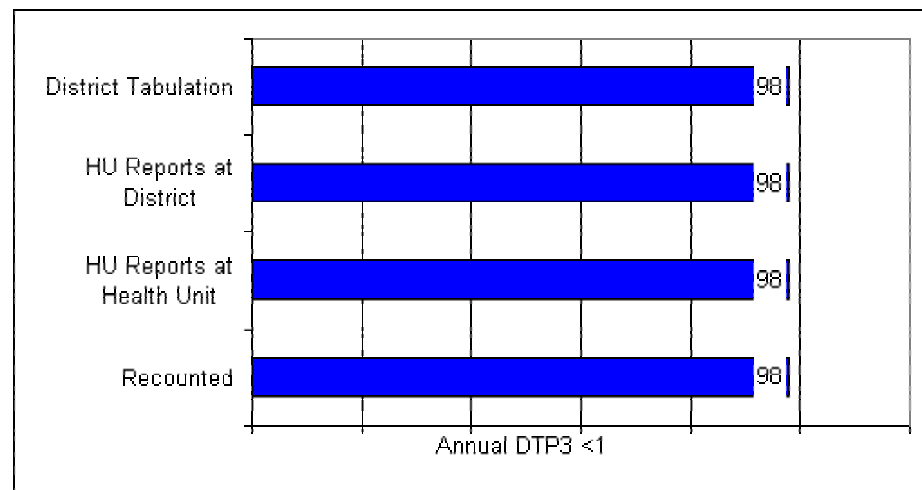
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Accra Metro - Audit Year 2001

Audit Date: 09/07/2002

A. Performance Indicators - 2000 and 2001

Calendar year	Reported DTP3 <1	Change in reported DTP3 <1	DTP3 <1 coverage rate	%dropout DTP1<1 to DTP3<1
2000	44,646		65.4%	-5.0%
2001	48,244	3,598	69.7%	-2.4%

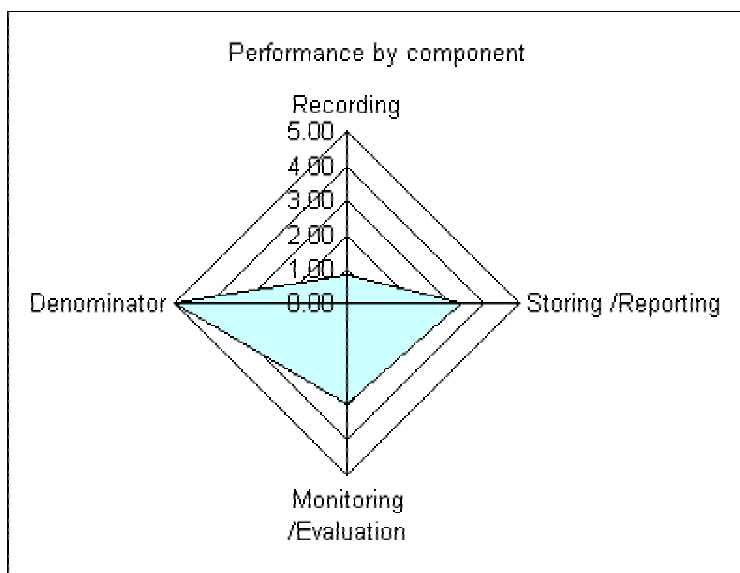
Based upon annual totals at District Office

B. Completeness - 2001

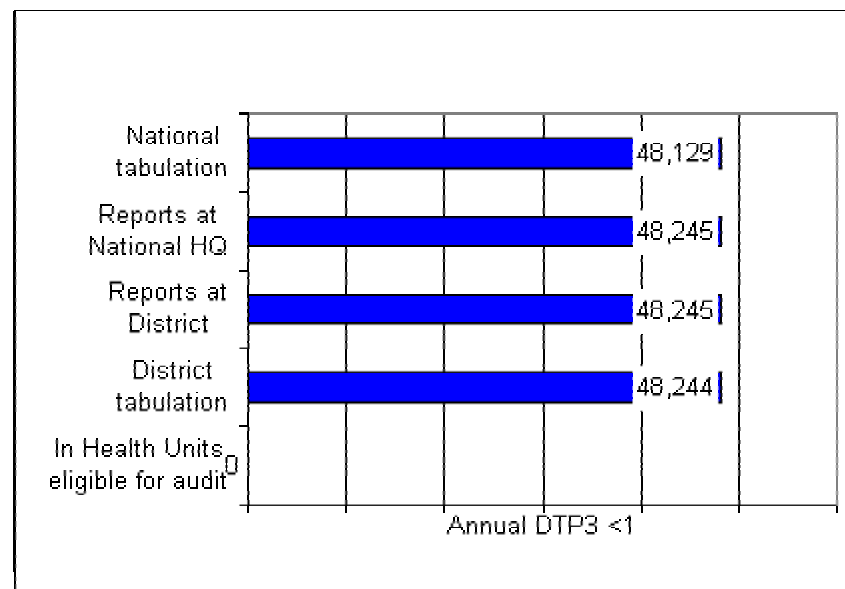
Quality of System Index Score	National level		District level	
	% District's reports found at Nat. level	% District's reports on time at Nat.lev.	Nos. HUs reporting in audit year	% HU reports found at district level
57.1%	100.0%	0.0%	22	100.0%

Based on HUs included in HU sampling

C. Quality of the System Index by Component



D. Annual DTP3 <1 by Source for Year 2001



Mantsiman, Accra Metro District - Audit Year 2001

Audit date: 10/07/2002

A. Performance Indicators - 2000 and 2001

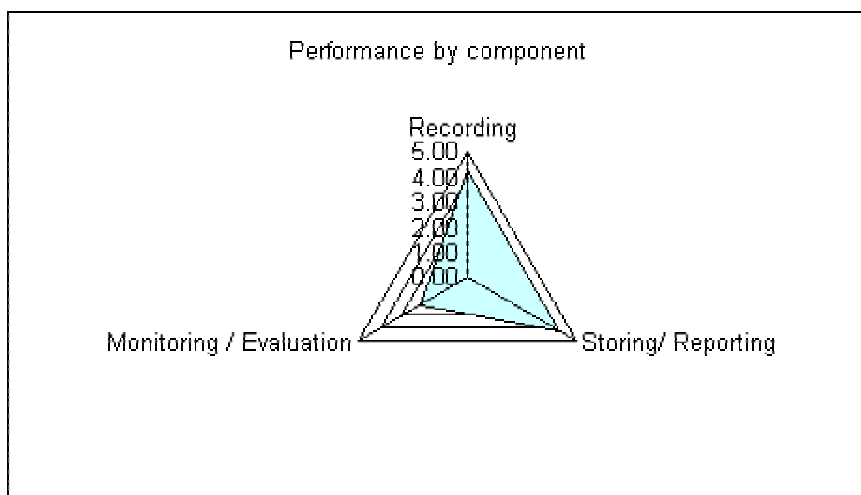
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	missing				
2001	664	missing	missing	missing	71.4%

B. Completeness for Year 2001

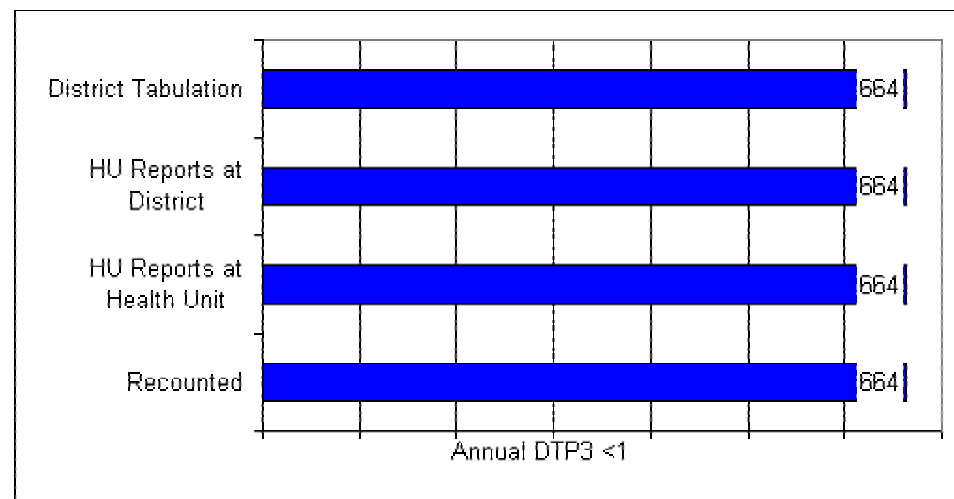
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

Based on information found at the Health Unit

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Achimota Hospital, Accra Metro District - Audit Year 2001

Audit date: 10/07/2002

A. Performance Indicators - 2000 and 2001

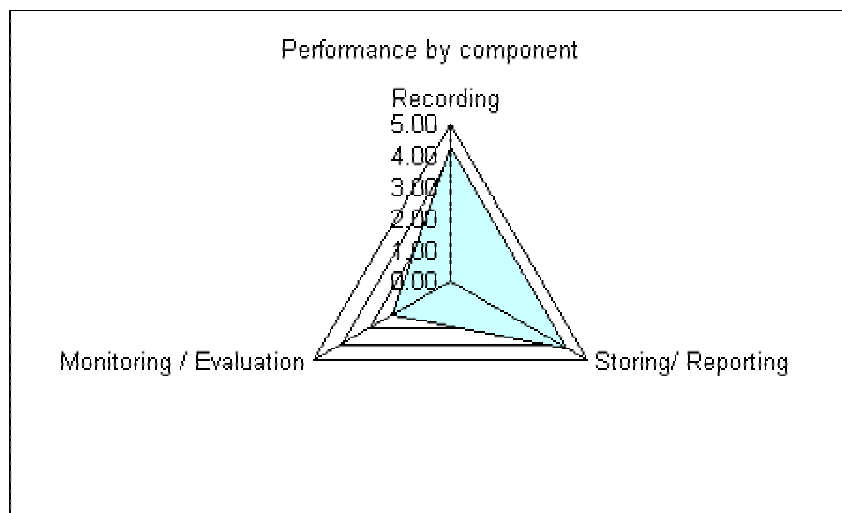
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	missing				
2001	1,025	missing	missing	missing	71.4%

Based on information found at the Health Unit

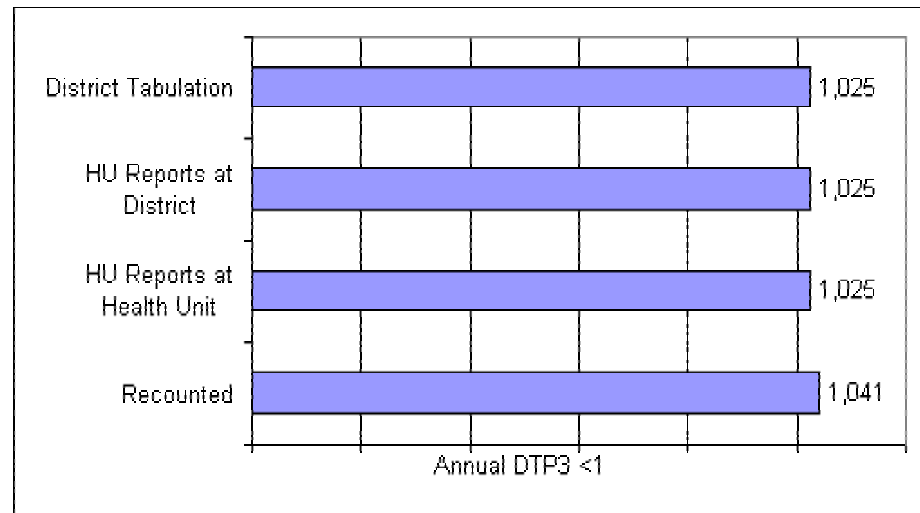
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Fadama, Accra Metro District - Audit Year 2001

Audit date: 10/07/2002

A. Performance Indicators - 2000 and 2001

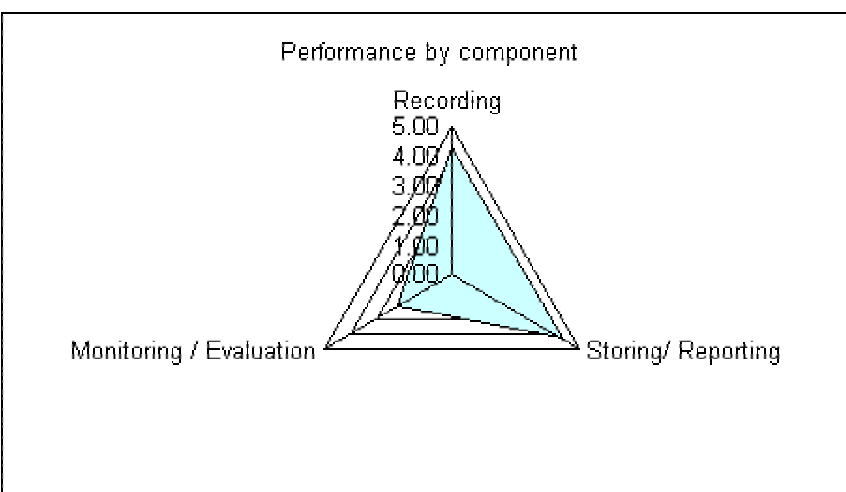
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	missing				
2001	962	missing	missing	missing	71.4%

B. Completeness for Year 2001

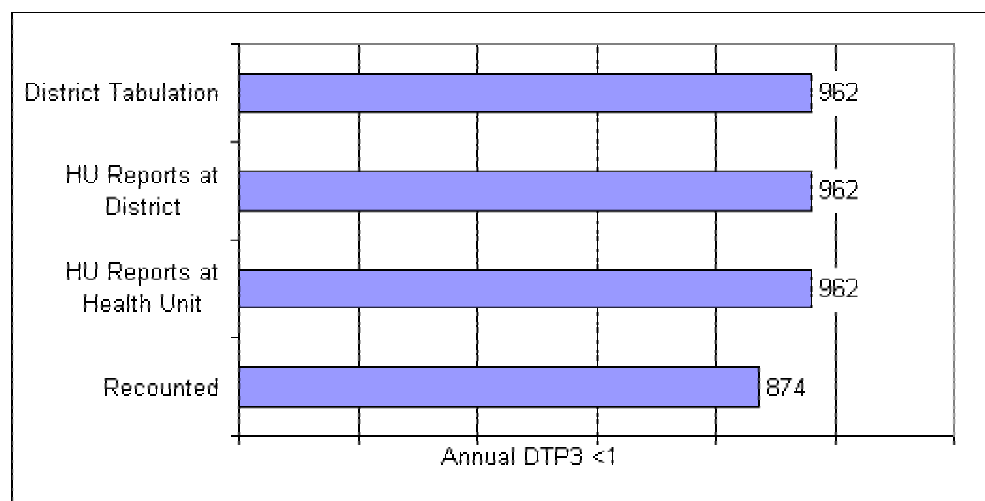
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

Based on information found at the Health Unit

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Mamprobi Polyclinic, Accra Metro District - Audit Year 2001

Audit date: 11/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	5,350				
2001	5,195	-155	missing	missing	58.3%

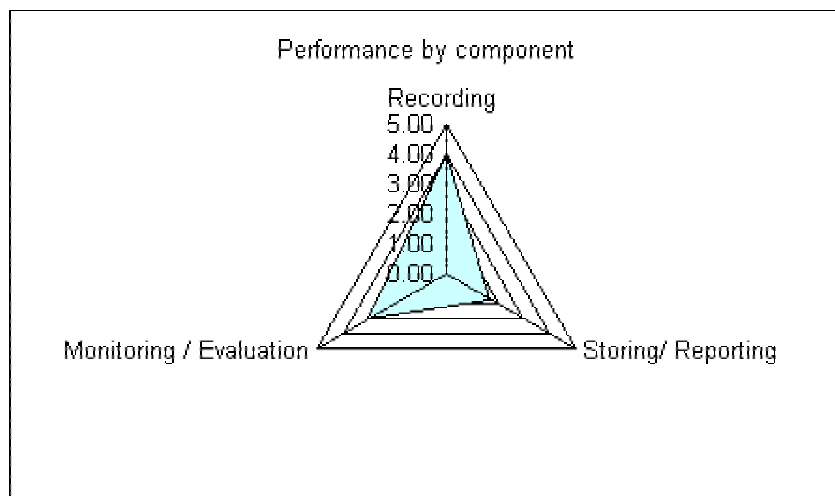
Based on information found at the Health Unit

B. Completeness for Year 2001

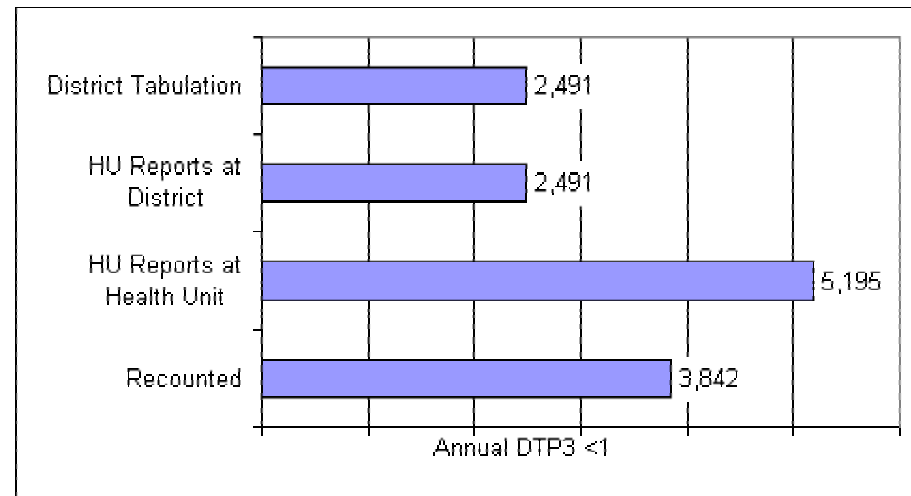
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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41.7%	0.0%	91.7%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Korlebu Teach Hosp, Accra Metro District - Audit Year 2001

Audit date: 11/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	198				
2001	227	29	51.9%	missing	28.0%

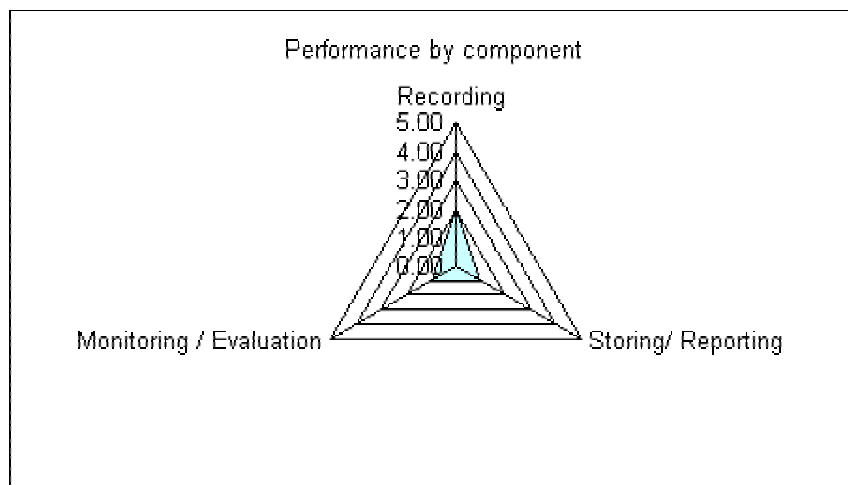
Based on information found at the Health Unit

B. Completeness for Year 2001

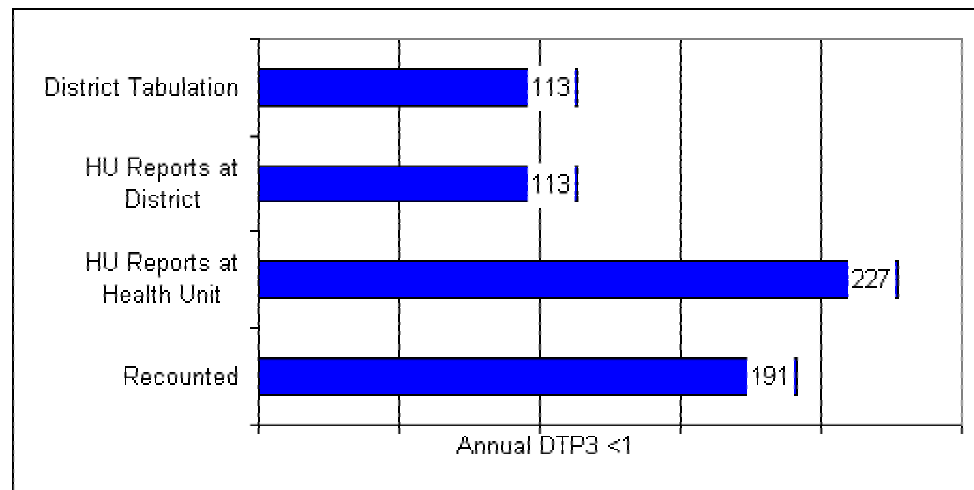
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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50.0%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Dansoman Health Cen, Accra Metro District - Audit Year 2001

Audit date: 12/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	4,222				
2001	5,224	1,002	missing	55.4%	74.1%

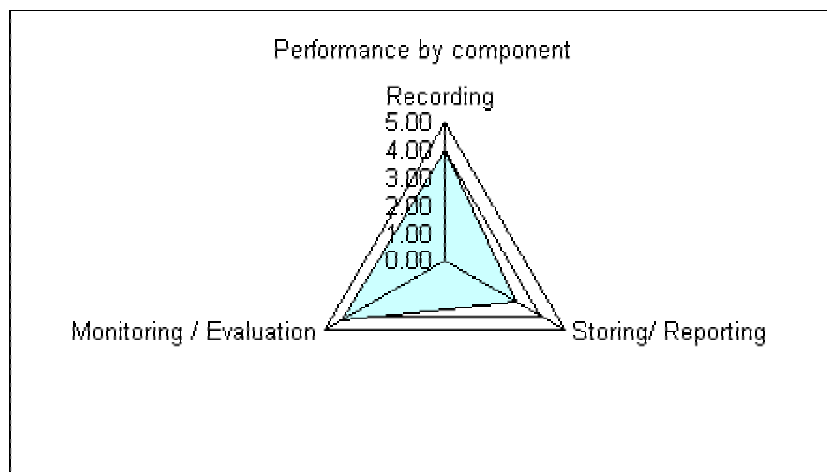
Based on information found at the Health Unit

B. Completeness for Year 2001

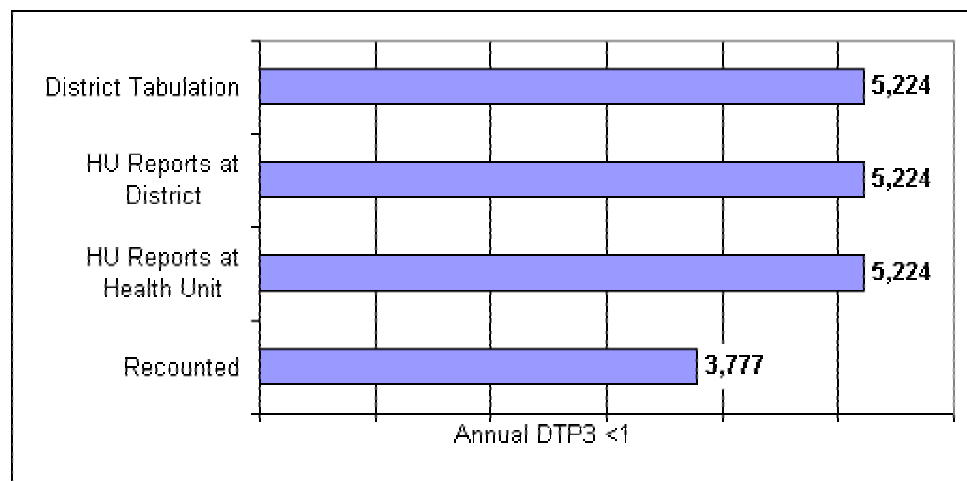
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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100.0%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Birim North - Audit Year 2001

Audit Date: 15/07/2002

A. Performance Indicators - 2000 and 2001

B. Completeness - 2001

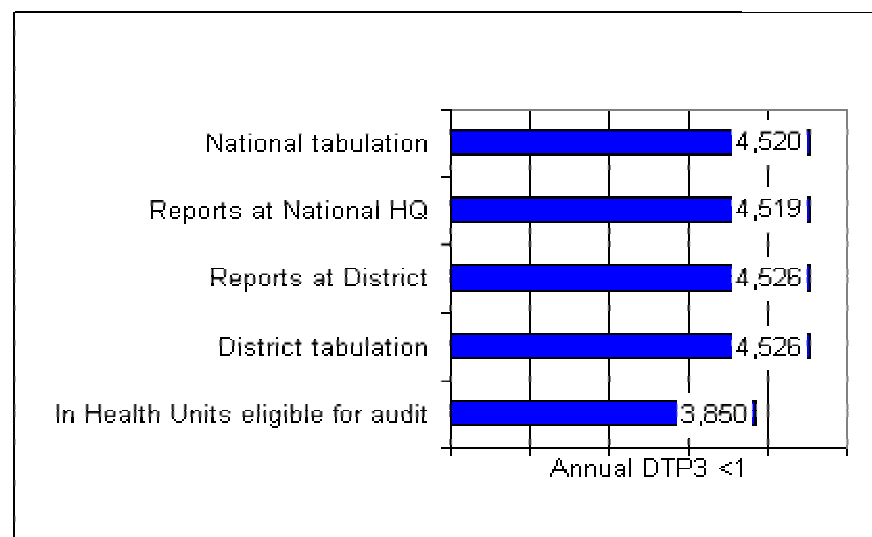
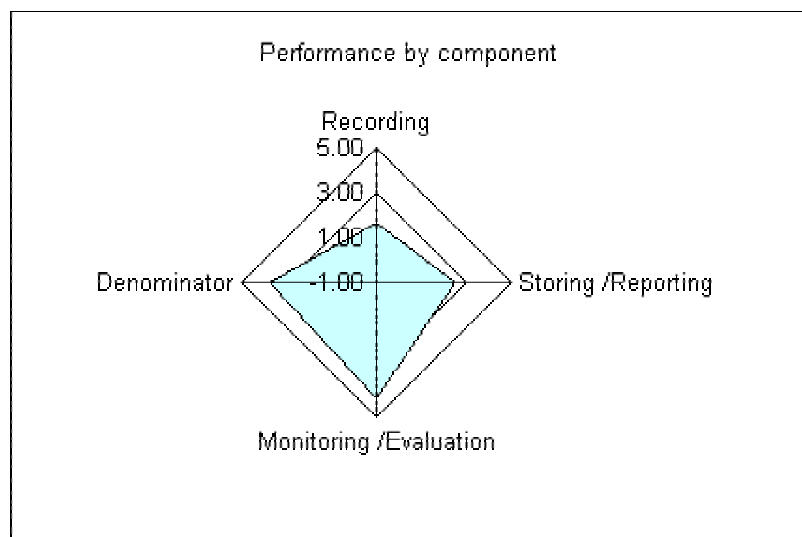
Calendar year	Reported DTP3 <1	Change in reported DTP3 <1	DTP3 <1 coverage rate	%dropout DTP1<1 to DTP3<1	%DTP vaccine system wastage	Quality of System Index Score	National level		District level	
							% District's reports found at Nat. level	% District's reports on time at Nat.lev.	Nos. HUs reporting in audit year	% HU reports found at district level
2000	4,194		97.3%	23.7%						
2001	4,526	332	88.8%	25.3%	missing	64.3%	100.0%	100.0%	21	87.3%

Based upon annual totals at District Office

Based on HUs included in HU sampling

C. Quality of the System Index by Component

D. Annual DTP3 <1 by Source for Year 2001



Afosu, Birim North District - Audit Year 2001

Audit date: 15/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	419				
2001	111	-308	12.6%	missing	26.9%

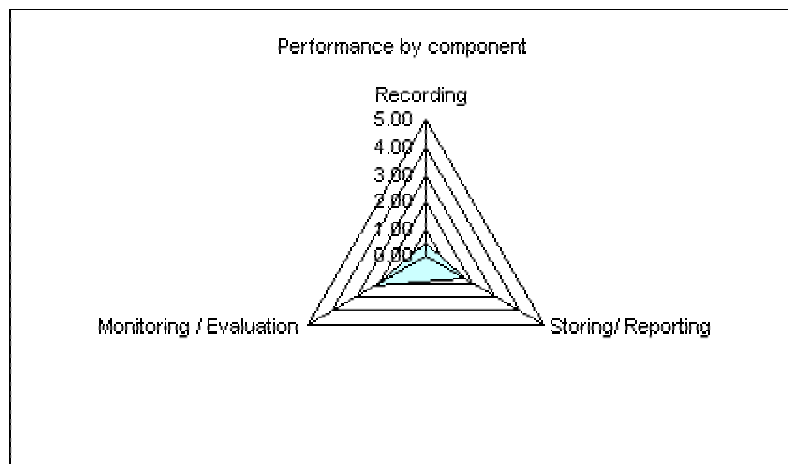
Based on information found at the Health Unit

B. Completeness for Year 2001

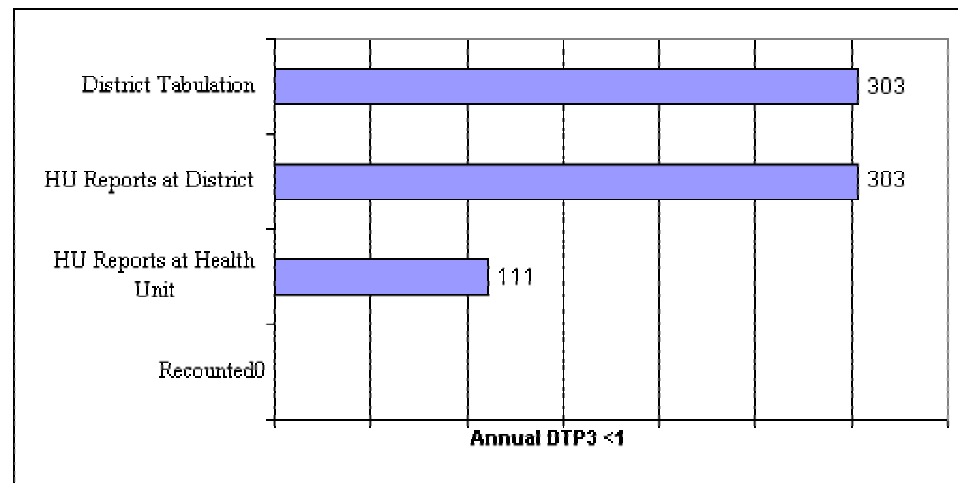
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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91.7%	0.0%	33.3%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Brenase, Birim North District - Audit Year 2001

Audit date: 16/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
---------------	-----------------	---------------------------	---------------------------	----------------------	-------------------------------

2000	425				
2001	418	-7	-26.7%	missing	42.3%

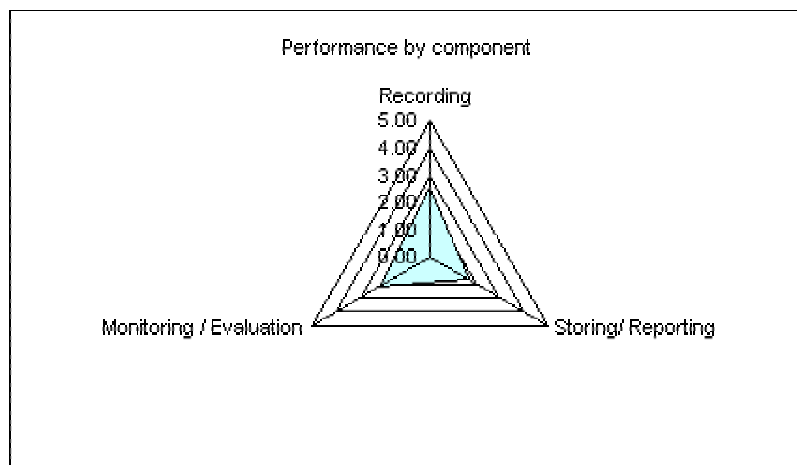
Based on information found at the Health Unit

B. Completeness for Year 2001

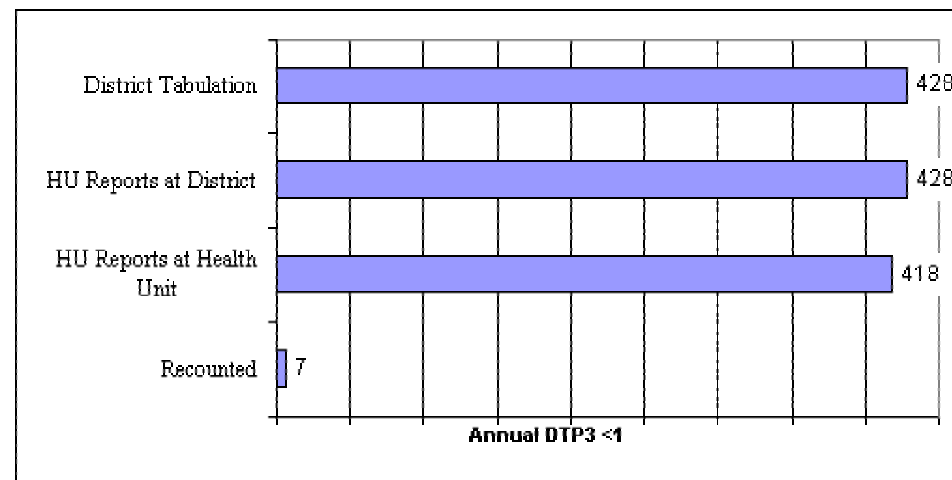
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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100.0%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



New Abirem, Birim North District - Audit Year 2001

Audit date: 18/07/2002

A. Performance Indicators - 2000 and 2001

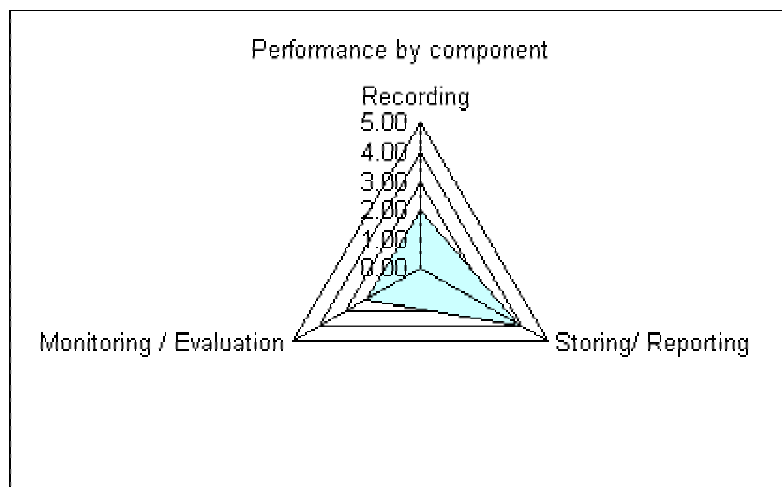
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	194				
2001	241	47	24.9%	missing	53.8%

Based on information found at the Health Unit

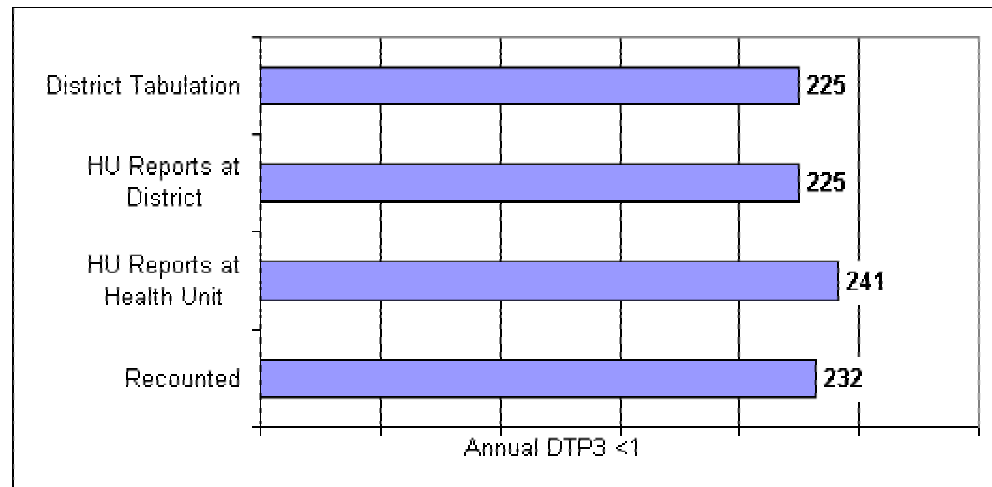
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Adausena, Birim North District - Audit Year 2001

Audit date: 17/07/2002

A. Performance Indicators - 2000 and 2001

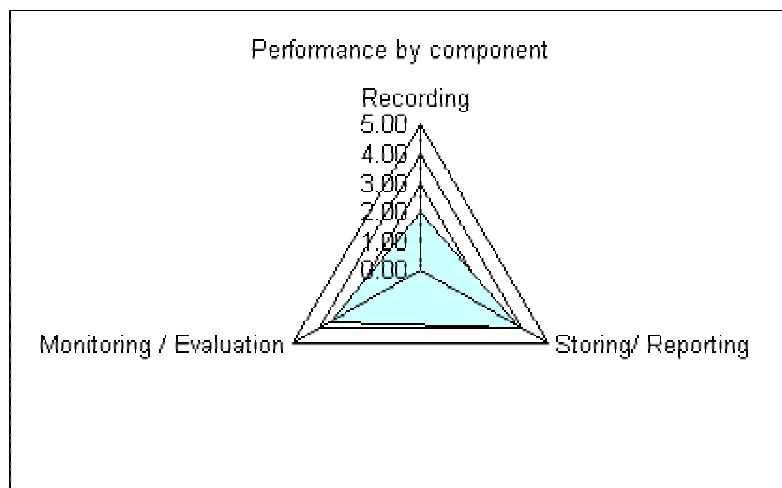
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	425				
2001	228	-197	30.1%	missing	61.5%

Based on information found at the Health Unit

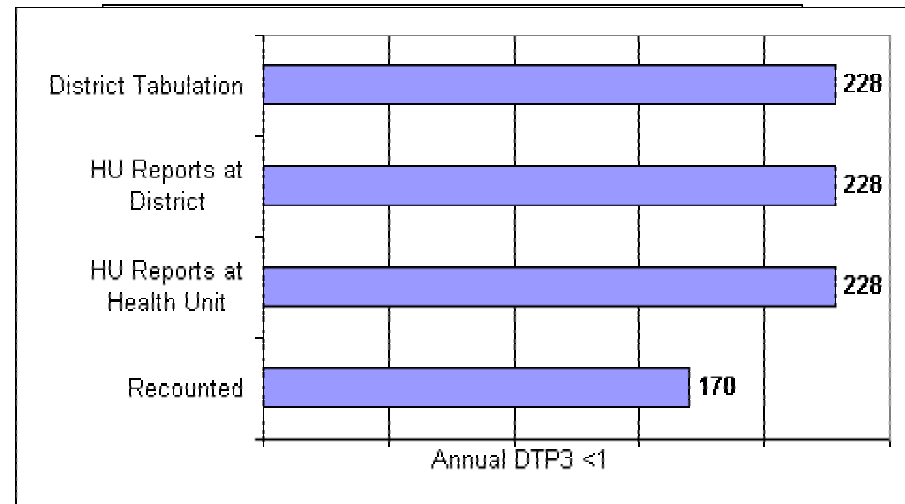
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
100.0%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Akoasi, Birim North District - Audit Year 2001

Audit date: 17/07/2002

A. Performance Indicators - 2000 and 2001

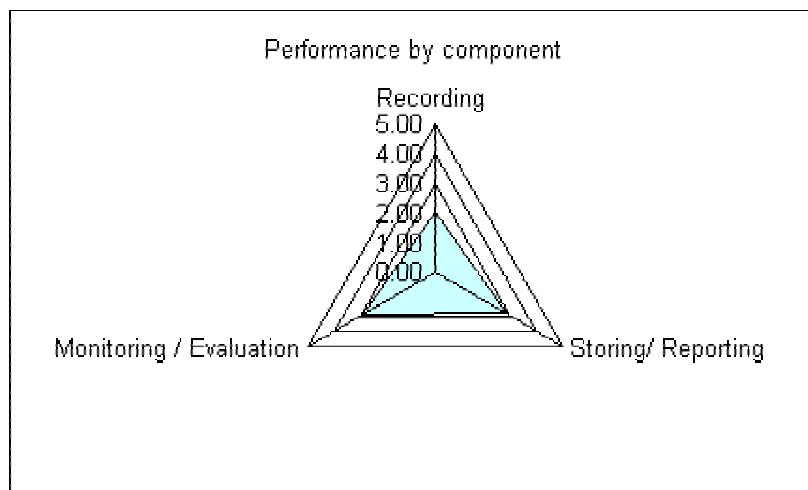
Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
2000	136				
2001	120	-16	6.3%	missing	50.0%

Based on information found at the Health Unit

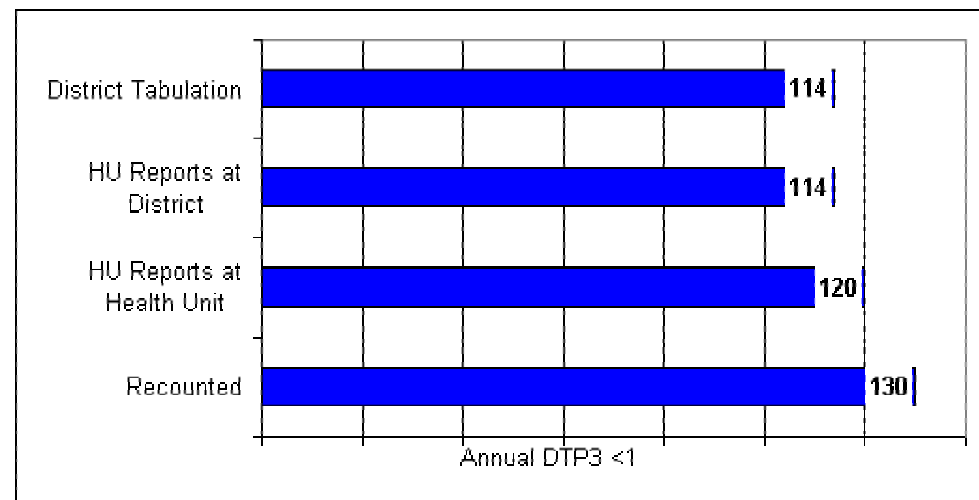
B. Completeness for Year 2001

% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
91.7%	0.0%	100.0%

C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Akokoaso, Birim North District - Audit Year 2001

Audit date: 16/07/2002

A. Performance Indicators - 2000 and 2001

Calendar Year	Reported DTP3<1	Change in reported DTP3<1	%dropout DTP1<1 to DTP3<1	%DTP vaccine wastage	Quality of System Index Score
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2000	394				
2001	148	-246	4.5%	missing	30.8%

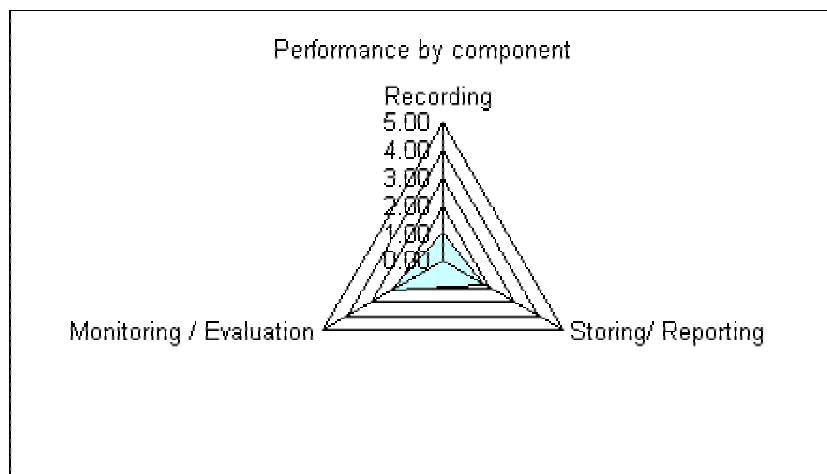
Based on information found at the Health Unit

B. Completeness for Year 2001

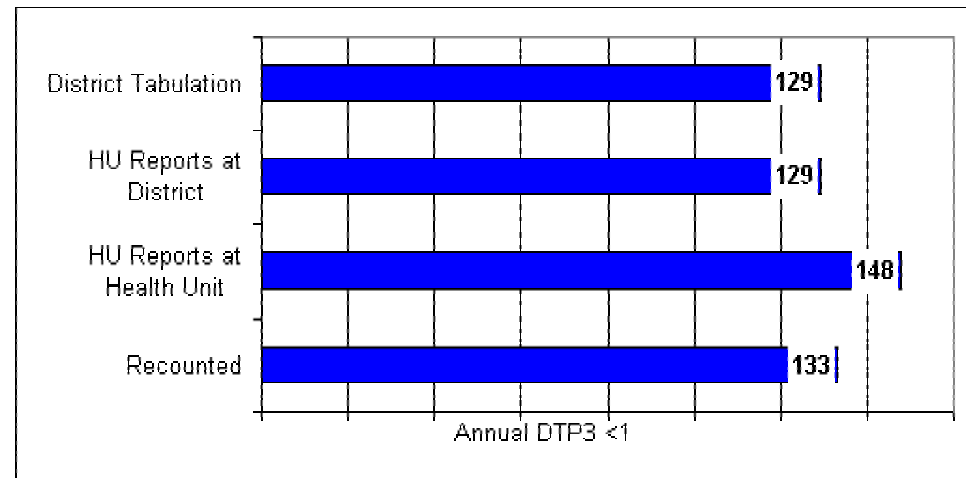
% of year's report found at District level	% reports on time at District level	% of year's report found at Health Unit level
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91.7%	0.0%	100.0%
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C. System Index Quality by Component Year 2001



D. Annual DTP3 by Source for Year 2001



Annexe c:

- **PowerPoint Presentation from Debriefing**

Annexe d:

- **2001 National Vaccine Wastage (source: MOH)
Example of compilation errors (source: one of the audited HU's
marking book)**

Annexe e:

- **“Strategic Plan of Action for Injection Safety of EPI”**