

GAVI
DATA QUALITY AUDIT

KENYA

2 – 17 AUGUST 2004



**LIVERPOOL ASSOCIATES IN
TROPICAL HEALTH, UK**

in association with



**EURO HEALTH GROUP,
DENMARK**

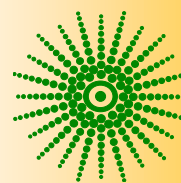


Table of Contents

Executive Summary	1
1 Introduction	2
1.1 Our Approach and Mobilisation	2
2 Background	3
2.1 The National Context	3
3 Key findings	4
3.1 Data Accuracy.....	4
3.2 Key Issues at National Level	7
3.3 Key Issues at District Level.....	9
3.4 Key Issues at Health Unit Level.....	11
3.5 Core indicators.....	12
3.5.1 Vaccine Safety.....	12
3.5.2 Wastage.....	12
3.5.3 Completeness of Reporting.....	13
3.5.4 Other Core Indicators	13
3.6 Changes Since last DQA	14
4 RECOMMENDATIONS	14
4.1 Priority recommendations	14
4.2 Other recommendations	14
5 ANNEXES	17
Annex I – Key Informants	17
Annex II – Quality Index Analysis Tables	19
Annex III – Core Indicators Tables	20

Executive Summary

Objective of DQA:

The DQA 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.

Method:

The DQA was undertaken by one external senior auditor and two external trainee auditors together with three National auditors, who worked at national level of HMIS and EPI before visiting four districts and six health facilities in each district. All four districts and 24 health facilities were selected randomly. The standard DQA method (GAVI, 2003) was applied, which included use of interviews, administration of questionnaires and recounting.

Table 1. DQA Indicator Dashboard

	DQA Audit Year 2000 (Pilot audit)	DQA Audit Year 2001	DQA Audit Year 2003	Change from Audit Year 2001 to Audit Year 2003
Verification Factor (>0.8) (Compares recounted to reported DPT3)	0.40	0.50	0.85	+0.35
Core Indicators:				
DTP3<1 Coverage	56.1%	66.4%	73.2%	+6.7%
Drop Out Rates (DTP<1 to DTP3<1)	18.1%	14.3%	15.8%	-0.1%
Injections and Vaccine Safety	No	No	Yes	
DTP Vaccine Wastage Rate	NA	NA	0%	
Completeness of Reporting	86.4%	86.8%	99.9%	+6.1%
Vaccine Stock-Outs	NA	NA	NA	NA
Action Plans for Districts	No	Yes	Yes	
QSI at National Level	68%	67%	81%	+14%
Average QSI for Districts	45%	61%	82%	+21%
Average QSI for Health Units	NA		85.1%	

Summary of principal findings and prioritised issues:

Reporting: All HU visited except one had tally records for the audit year. A register was used to recount at the HU which did not have tally records. Vaccine stock ledgers were missing in many HUs for audit year but were available and up-to-date during the time of audit. **Use of Data:** KEPI has taken strides to develop a robust system with proper monitoring and evaluation tools and guidelines. Performance monitoring was evident at all levels during the audit. However, use of data for wastage and stock out monitoring remains an issue. **Design:** The KEPI immunization reporting system remains vertical and is the sole custodian and official database for immunization reporting for Kenya. It does report all immunizations independent of each other i.e. DTP 1,2,3, separately for under and over ones. The registers allow tracking of first and follow-up visits amongst under ones.

Key Recommendations:

- Introduction of ledgers for monitoring syringes and general supplies.
- Support and strengthen HU staff capabilities in setting targets based on past achievements, monitoring wastage, coverage (not only for DTP and measles) through on-the-job-training (OJT). The PMH and VMG are resource materials for OJT.



- There is need to review strategies that could support increased immunization coverages considering the fact that systems to support the process are in place and functioning.

1 Introduction

The 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 DTP3 vaccinations given to children under one year of age (DTP3 <1). In 2004, the DQA is being performed in up to 14 countries for the Audit Year 2003. It is hoped that participation in the DQA will assist each country in understanding the extent and details of the verification 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 Kenya, 2-17 August 2004, by the following team:

Table 2. Audit Team Members

Name	Position	Districts Visited
Maxwell Moyo	Senior External Auditor	Dagoretti, Migori
Rete Trap	Trainee External Auditor	Dagoretti, Kitui
Carmeliza Rosário	Trainee External Auditor	Dagoretti, Uasin Gishu
Josephine Odango	National Auditor	Dagoretti, Migori
Amina Ismael	National Auditor	Dagoretti, Kitui
Titus Kolongei	National Auditor	Dagoretti, Uasin Gishu

All newly WHO trained auditors are accompanied by an experienced senior auditor in their first country DQA.

1.1 Our Approach and Mobilisation

To conduct the DQA the standard method previously used on other countries was applied at national, district and health unit levels consisting of (1) a set of questions concerning the functioning of the EPI programme, HMIS and vaccines stock management at each level; (2) a set of questions specific for each level to estimate the quality scores and (3) a recounting of DTP3 doses administered during the audit year from the tally sheets present at health unit level.

The team worked at the national level KEPI offices and met HMIS Officials before going to district and health facility levels. Based on a random selection carried out in advance, the following four districts were visited: Dagoretti, Kitui, Migori and Uasin Gishu, and six Health Units (HU) were selected randomly in each district. A relatively high number of Hus were found to be NE due to local security concerns. There were no major constraints and all activities were carried out according to plan and schedule.

A debriefing meeting held on 17 August 2003 with the ICC chaired by the Director of Preventive and Promotive Health Services Dr. Ambrose Misore. Present at the meeting were the KEPI manager and her team, representatives from the donor partners, WHO, UNICEF, JICA, USAID and PATH. A comprehensive list of persons met during the DQA including the debriefing is included in Annex 1 of this report. The members acknowledged the report and



confirmed their commitment to addressing the recommendations as outlined in the recommendations section of this report.

2 Background

2.1 The National Context

The Kenya Expanded Programme on Immunization was established as a unit under the Maternal and Child Health/ Family Planning (MCH/FP) services within the Ministry of Health (MoH) in 1980, with a goal of providing immunization against six vaccine preventable diseases; diphtheria, pertussis, tetanus, poliomyelitis, tuberculosis and measles to all children in Kenya. The KEPI schedule was later expanded to include tetanus vaccinations for pregnant women and vaccinations against Hepatitis B, Haemophilus influenza and vaccinations against yellow fever in districts where yellow fever is endemic. In October 2001 KEPI introduced the combined “Diphtheria-Pertussis-Tetanus (DPT) Hepatitis B (HepB) and haemophilus influenza B (Hib)” vaccine.

Immunization services are offered by the government and Non-Governmental health service providers in all the 78 districts in the eight provinces of Kenya at over 2,500 health service delivery points (SDPs). Immunization activities among others operate in a decentralised environment whereby the District Health Management Team (DHMT) under the District Medical Officer of Health (DMOH) oversee the proper functionality of all the systems and operations of the immunization activities in the districts. The District Health Public Nurse (DPHN) is the key person regarding immunization activities supported by the District Divisional Public Health Supervisors (DDPHS) who have lately been appointed to support supervision for a selected number of health facilities in the districts. The Provincial Health Management Team (PHMT) supervises the districts while policy formulation, development of standards, procurement of vaccines and supplies and donor coordination is KEPI’s responsibility. The Provincial Logistician and the Provincial Public Health Officer are KEPI focal persons at the Provincial level.

KEPI maintains a vertical Immunization Management Information System whose primary role is to maintain a database for the routine immunization. Currently, KEPI has introduced an EPI INFO database to track routine immunisation data which has already been rolled out to some districts in the country. The primary immunization records are tally sheets used for static and outreach activities. All children are supposed to be registered and tracked in the Children Permanent Registers and pregnant women receiving TT2+ are included in the Antenatal Clinic Registers. The tally sheets are used for compiling monthly summaries. The design of the children permanent registers allows to track first and follow-up visits up to the point the child is fully immunized. Health units are responsible for compiling and submission of monthly reports to the district, the districts to the Province and the Provinces to the National level. A copy of the monthly report is submitted to the district and one retained at the HU level. Similarly the Districts and the Provinces retain a copy of each report sent to the upper levels. While the HUs also report morbidity and mortality data to the Health Management Information Unit, no data on immunization is included in the HMIS reports.

Kenya has since 2001 been struggling to improve its systems pertaining to immunization while at the same time taking strides to increase immunization coverage after negative results of the first DQA in 2001 and second one in 2002. Significant support has been provided from GAVI, UNICEF, WHO and other development partners in an attempt to address the shortfalls of the 2001 and 2002 DQAs and thus this report documents the findings of the follow-up DQA to the two DQAs of 2001 and 2002.



3 Key findings

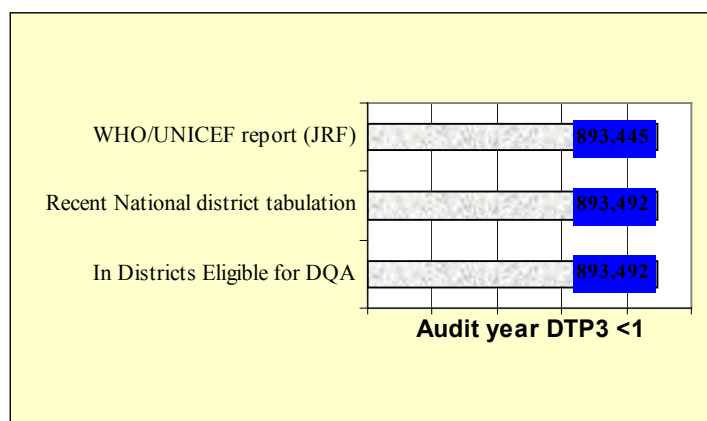
3.1 Data Accuracy

Data accuracy is quantified in the DQA verification factor. Principal pre-requisites for a good verification factor are:

- Accurate aggregations whereby national HMIS reported values for DTP3<1 reflect the exact number of clients tallied.
- Complete quarterly HMIS reports available at the HUs, at the districts and at National level. The district HMIS database should be up-to-date and complete
- Complete tally records for each month of the audit year (2003) available at all HUs. This requires that the records are not only completed, but well organized and easily retrievable as well.

One aspect of data accuracy is the consistency of the total national DTP3<1 in 2003 reported in different sources. There was a slight difference between the WHO/UNICEF JRF and the national district tabulations (47). This resulted from data cleaning when a transcription error was noted in one of the entries. Figures in the National Tabulation, National District Tabulation and those for the districts eligible for audit were all the same. The following figure summarises this information.

Figure 1. Reported DTP3 Doses Under 1 (2003)

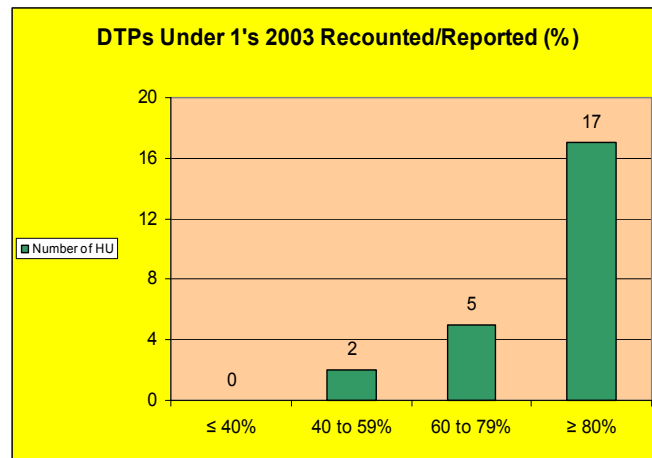


The verification factor (VF) is the ratio between the DTP3<1 recounted from tally sheets at the selected health facilities and reported from the health facilities (extrapolated to the whole district) and the national level. The verification factor found for Kenya is **0.85** (95% Confidence Interval: 0.68 to 1.03). The ratios of recounted to reported values amongst the districts ranged from 0.48 in Uasin Gishu district to as high as 1.25 in Migori District. These outliers are a contributing factor to the large confidence interval.

The availability of tallies in most of the HU was a very positive contribution to the VF. As a proxy indicator of the contribution of both high and low recounts into the VF, calculations of the ratio of recounted to the reported DTP3<1 doses at health unit level have been done and plotted the number of health facilities with different levels of concordance (see Figure 2 below). This graph shows that the group with the highest number of health facilities (namely 17) was the one in the group “>=80%” and that the lower intervals showed decreasing numbers of health facilities with none with a ratio less than 40%. The conclusion is that the use and storage of tally sheets was quite good. At the one HU where tally sheets were not present, recounting was done from “The Permanent Child Register”.



Figure 2. Distribution of the number of health units according to the percentage of DPT3 doses recounted in relation to those reported



TT2+ were also recounted in the HU. Variations in recounted against reported were noted in many HUs. More often recounts were higher than reported. Many Health Workers reported that they use the ANC registers when tallying and compiling monthly summaries which are not consistent regarding the data they are meant to collect.

Amongst the 22 health units where measles could be recounted, only one HU had a ratio of less than 80% of the recounts against the reported with a range of 52% to 114% at Matoso and Nyakuru in Migori respectively.

In the 23 HU where DTP1<1 could be recounted, only three HU had a ratio of less than 80% of recounts against reported. The range of recounts to reported figures were 34% to 103% in Waithaka in Dagoretti and Matoso in Migori districts respectively.

Figure 3 and 4 show the distribution of the number of health units according to the percentage of Measles and DTP1<1 doses recounted in relation to those reported (only health units with data available).

Figure 3. Measles Recounts/Reported

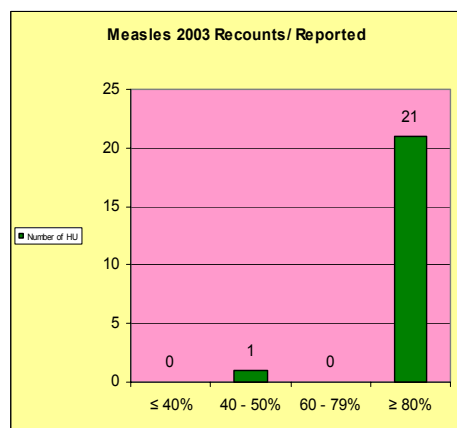


Figure 4. DTP1<1 Recounts/Reported

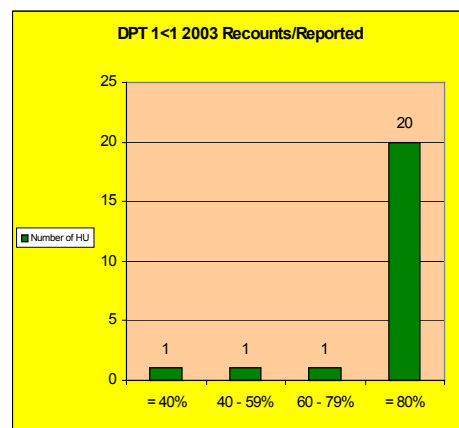


Table 3. Reported DPT3<1 2003, according to different sources, for selected districts

DPT3<1 2003	Migori	Dagoretti	Kitui	Uasin Gishu
National tabulation	11,646	12,300	16,751	23,521
National district tabulation	11,646	12,300	16,751	23,521
National district's reports	11,646	12,970	16,455	23,521
District reports found at national level	12	12	12	12
District's own tabulation	11,775	11,318	16,455	25,087
District's reports at district	10,920	11,318	16,455	25,117
District's reports found at district	12	12	12	12
HUs eligible for sampling	39	20	37	77

Table 3 above presents DPT3<1 figures for the selected districts. The table highlights the issues of reporting consistency between National and district level and of district under- or over-reporting to the national level. Under- as well as over-reporting has an impact on the VF. The table also highlights the need for KEPI to improve the reporting system including timely, complete and accurate reporting and recording at all levels. It is disturbing to see that not one of the four selected districts have complete data consistency between the five recorded figures for DTP3<1.

Tally Sheets

HUs report immunization performance based on recounts from the tally sheets used for static and outreach activities. For the audit year, all 24 but one HUs had tallies. However, in most cases, some parts of the months and outreach tallies were missing. Almost all HU which had kept the tally records were kept in files and organized by date, and HU staff were able to locate them. At one HU, recounting was done from the register because tally sheets for the audit year were not available.

Other issues with the tally sheets are listed below:

- Tallying. When tallying, some did double zero crossing leading to double counting whereas other health workers used faint ink when tallying which could easily be missed when recounting.
- Filling out the tallies: In many facilities staff attempted to use the monthly tally forms for more than one month which confused them in aggregation.
- Outreach tallies: In some HU, only the static tallies were used in compiling the monthly reports and hence the facility actually under-reported performance.

Reports

- Over-reporting. The number of doses reported at health unit level was higher than the recounted in 14 health units. However, this does not necessarily mean over-reporting because it was often not possible to determine if the tallies used for outreach were included and as well transcription errors by health workers. Therefore, it is not possible to assure that there was over-reporting as such. There is no evidence in any case of inflated or creative reporting.
- The difference between the district tabulation and reports at district in Migori district was explained to be due to loss of some reports by the district particularly from outreach clinics under the MOHs Office which were filed separately from the static ones.



Table 4. DPT3 doses according to district tabulations and reports at the district level (2003)

	District tabulation	Reports at District	Comment
Dagorreti	11318	11318	
Kitui	16455	16455	
Migori	11775	10920	7% of the reports lost
Uasin Gishu	25087	25117	Transcription error

3.2 Key Issues at National Level

The quality of the system index (QSI) is a composite indicator of the overall quality of the immunization reporting system, which is calculated for each health unit and district visited, as well as for the national level. Please note the national QSI is not a composite of the scores at all other levels, but rather a score for findings at one level only. At the national level the QSI is composed of scores in five specific areas, namely: "Recording", "Reporting/Storage", "Monitoring/Evaluation", "Denominators" and "System Design".

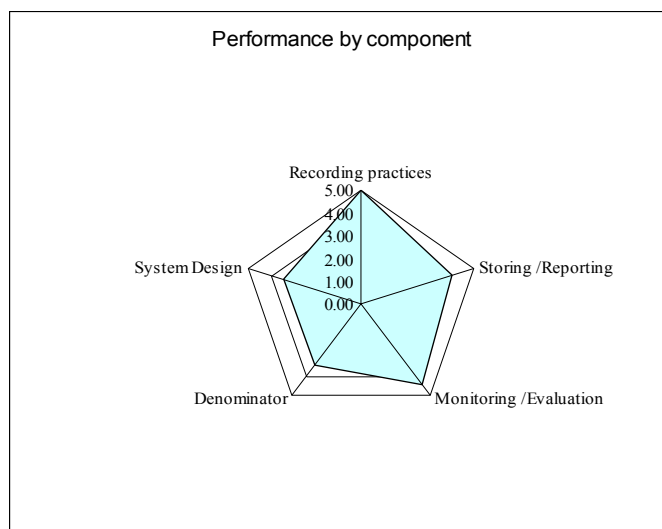
The national level QSI average for audit year 2003 is 80.8%.

Areas that were particularly strong include:

- The recording practices in the recording of vaccine stock data including batch number and expiry dates, processing of reports and availability of forms;
- Performance monitoring with a well developed comprehensive performance Management handbook; the Vaccine Management Guidelines, KEPI supervision documentation handbook, routine feedback to the lower levels, displaying of performance charts, monitoring drop-out rates, reporting timeliness and completeness;
- System design that includes proper documented guidelines for the health workers to monitor the implementation process of the reporting system.

Figure 5 below shows the scores for the five components, each one evaluated from a scale of 0 to 5.

Figure 5. National Quality of the System Index by Components



Listed below are some details for each of the QSI components.

Recording Practices

Recording practise at the national vaccine store is extremely good. The ledger books were updated for both DTP and TT, with complete information on vaccine receipts and issues, and also with batch numbers and expiry dates for the audit year 2003. Immunization forms were sufficiently supplied in all the four districts.

Storing and Reporting

Immunization data is well stored by date and in some instances by HU and could be easily retrievable. There are written, routine computer back-up procedures, but back-up is only done monthly.



Monitoring and Evaluation

At National level the immunization coverage, drop-out rates and reporting completeness are updated and displayed and there are maps showing the individual districts performance. Timeliness is measured and all reports are dated when received from districts. However, there was no consistency in dating publications, print outs, or previous updates in the different documents presented or displayed.

Despite that KEPI has enhanced monitoring of supervision activities, feedback is done without formalized discussion of the data. Lists of tabulations and monitoring chart formats could be retrieved from archive files, posted on walls and formats from the KEPI Performance Management Handbook (KPMH).

There is weak monitoring of wastage at national level. The JRF for 2003 confirmed this by mentioning that the data used for calculating the reported wastage was not reliable. KEPI has mentioned that they are in a process of identifying a new software to monitor vaccine wastage.

Denominators

Denominators setting lack standards as districts set own denominators based on district growth rates while the national level do the same based on national growth rates (which is applied uniformly across the country). According to KEPI, up to mid 2004 the population projections for setting denominators have been based on the old census of 1989 until July 2004 when official results of the 1999 were received. This justifies the high coverages of over 100% for DTP and TT2+ for some districts in the audit year which resulted from using outdated census figures when making population projections.

Denominators at districts were not the same for district and national level. The base for calculating population projections is a major contributing factor to the differences.

System Design (scored 3.46)

The official regulations regarding the reporting of immunization data is well implemented at all levels of the immunization system. All district reports for the audit year used same format. Immunizations for DTP3<1, TT2+ are reported separately from other immunizations and there is written procedures for dealing with late reports. Ledgers are available at the national level for vaccines. However, despite the robustness of the KEPI MIS, it remains a vertical system which requires integration into the national HMIS. The head of HMIS acknowledged the current weaknesses regarding lack of integration amongst the various programmes. In addition, there is a gap in AEFI reporting.

National Level DTP3<1 Reporting: The figures reported in the JRF for 2002 are highly consistent with the current national tabulation including those for the under one population.

Table 5. Number of under 1s and DPT3 doses in different sources (2003)

2002	JRF	National tabulation	Difference
Under 1	1,221,219	1,221,219	0
DPT3	893,445	893,492	47
Coverage	73%	73.2%	0.2%

The differences in coverage by 0.2% is a result from data cleaning of data where under-reporting of 47 immunizations were traced after the JRF was already sent.



3.3 Key Issues at District Level

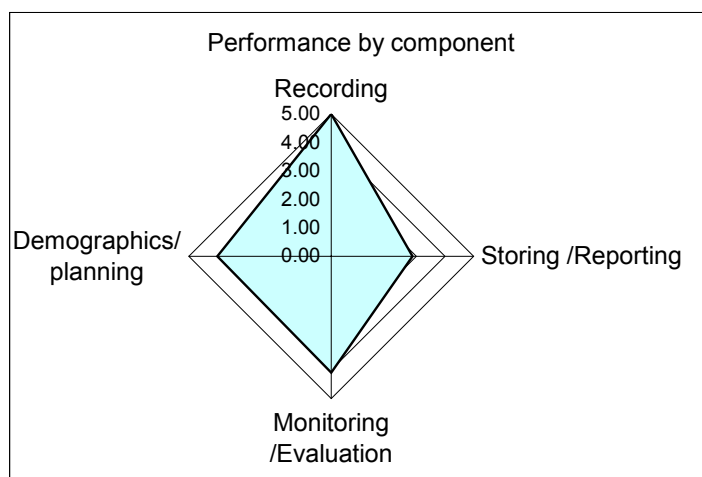
The Quality of System Index (QSI) for the four districts is as follows:

- Dagoretti 84,4%
- Kitui 81,1%
- Migori 81,1%
- Uasin Gishu 80,6%.

The four components of the district level QSI are Recording, Storing/Reporting, Monitoring/Evaluation, and Demographics/Planning.

Figure 6 below presents a “spider graph” of the performance of Kitui district from DQA Audit Year 2003 in Kenya. Please note that the best scores are for “Recording”, which is typical for all the four districts visited, while “Storing/Reporting” performance was the weakest area in 3 out of the 4 selected districts.

Figure 6. Quality of the System Index by Components – Kitui District



Recording: All four districts scored well in the recording component. All vaccine ledger books were up-to-date and with complete vaccine receipts. Other supplies, including syringes, are well monitored with stock cards or ledgers in three of the four districts.

Demographics/Planning: All districts had targets set both for the audit year and the current year. However, District Managers do not take into

consideration previous years' achievements and other factors like immigration when setting targets and thus either targets are either too high or too low. It was evident in all districts that targets were set at 100%, the estimated population of the targeted group from the total population.

The denominator value (for infant and pregnant women immunizations) were, in all four districts, different from their denominator value found at national level. The same reason of utilising different population growth rates, districts have own growth rates whereas the national uses a flat growth rate base of 3.8% for the entire country.

Districts maps were displayed in all the four districts to support community strategies. However, there was no awareness of the proportion of infants per strategy type in any of them.

Monitoring/Evaluation: All the four selected districts had charts displaying updated immunization coverage and drop out rates, and publications on their annual figures, tables and charts for the audit year. Timelines and completeness of the HU reports was monitored in three of the four districts. Provision of feedback, conduction of regular meetings with HU staff, provision of routine feedback, distribution of minutes for meetings including monitoring and supervision of immunization activities were found in three of the selected districts.



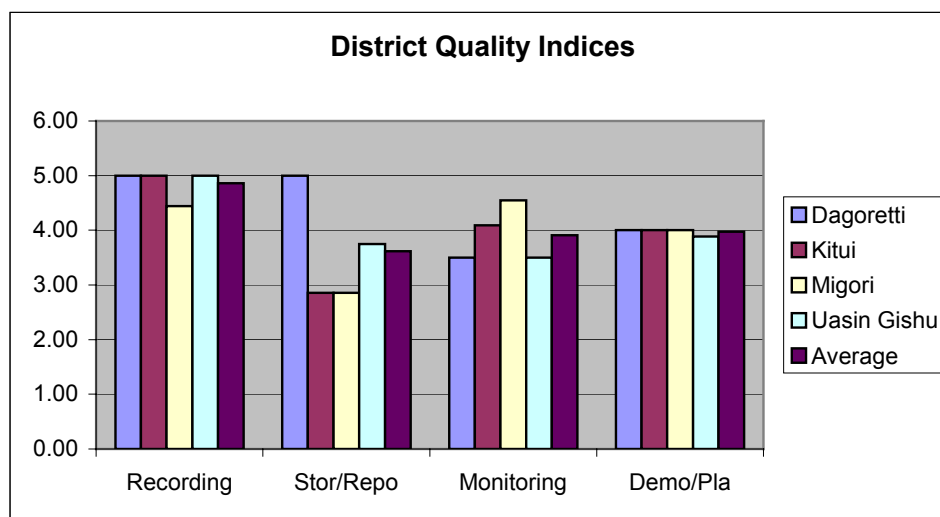
Monitoring of HU vaccine wastage and stock outs should be included in KEPI monitoring system.

Storing/Reporting: The most significant determinant of the poorer scores in this area was the absence of written backup procedures, the large intervals of backup and the missing date of printing/production on tabulation/chart in the three computerised districts.

All four selected districts had well-organized report handling procedures, the reports received from HU were immediately processed, procedures for handling late reports were in place and each HU data was filed by date and if not separately by HU.

Figure 7 below present a graphic depiction of the QSI component scores for each district.

Figure 7. Quality System Indices per Component – All Districts



Though the system of immunization reporting has improved much with regards to completeness, accuracy and timeliness, there is a decline in performance on immunization coverage by antigen. (see Table 6 below). Only Uasin Gishu district has increased its coverage rate to the high level of over 80% and at the same time decreased drop-out rates nearly to the recommended 10%.

In contrast to this the other three districts have either decreased their coverage rates or as in the case of Migori district kept a stationary and exceptionally low coverage rate below 50%, together with an increased drop out rate.

Table 6. Coverage and Drop-Out Rates

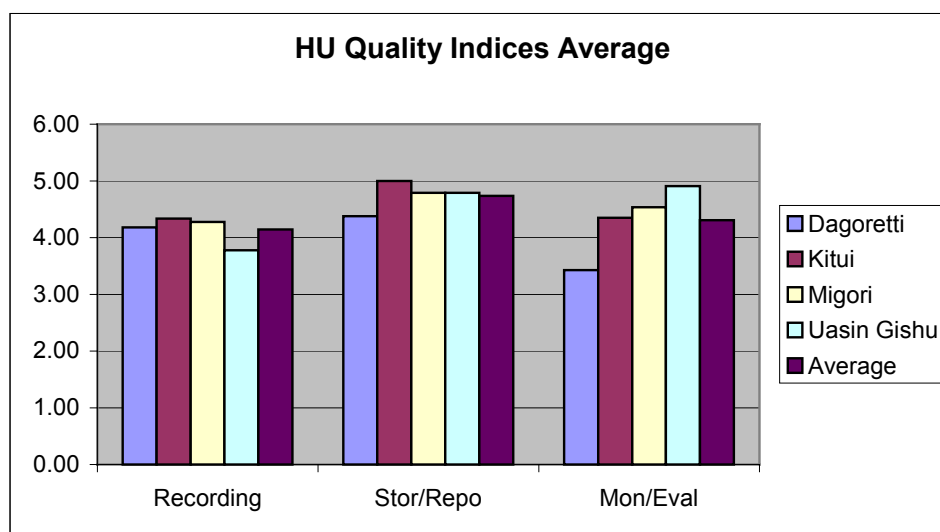
District	Year	Dagoretti	Kitui	Migori	Uasin Gishu
Coverage rate DTP3<1	2002	115,6 %	74,4 %	44,0 %	65,4 %
	2003	101,8 %	70,8 %	45,8 %	88,7 %
Changes in DTP3<1 2002-2003		-509	11	664	7105
Drop-out rate	2002	9.9 %	11,7 %	36,4 %	16,1 %
	2003	13,9 %	9,3 %	36,8 %	10,9 %



3.4 Key Issues at Health Unit Level

Figure 8 below represents the relative component scores for the health facilities visited in each of the four districts. Each bar represents the average score for each of the QSI (Quality System Index) component areas, per district. The graph illustrates the relatively poorer scores of the immunization data “Recording” compared to those of “Monitoring/Evaluation”, and specially “Storing/Reporting”. A notable exception is the Dagoretti district average scores in “Monitoring/Evaluation”, which scored under the overall average of any of the components.

Figure 8. District averages of scores of quality indicators for the health units



Recording: Immunization recording depends on tally sheets for each antigen, as well as child health cards and registers for both infants and pregnant women. The system appears to be well designed and well implemented in most of the HUs visited. The main reasons for low recording scores were due to the non-existence of ledgers or stock cards for syringes in the majority of the HU, as well as the non-existence of a complete ledger book for vaccines for the year 2003 in 14 of the 24 facilities visited. This has meant that we were unable to calculate wastage in more than half of the facilities. Additionally, 9 of the facilities did not possess registers for TT vaccine, and at least 7 of them had incomplete tally sheets.

Storing/Reporting: The high scores obtained in the storing-reporting category clearly indicate that, for the major part, information is available and reported at the health facility level. However, 9 of the HU there were no reports stored for the year 2002, and 3 had them incomplete for the same year. For the audit year (2003) only 2 had incomplete reports at HU level. Knowledge and understanding AEFI procedures is high. Only three HUs of the visited HUs did not know how to handle an AEFI. The other problem was non availability of forms to record an AEFI in most HUs which led health workers to record required information (batch number, expiry date and adverse reactions) on simple paper.

Monitoring/Evaluation: 58% (14) of the HUs did have catchment maps on the walls, showing the area of reach. 9 HU had no knowledge of the new births around their catchment areas. The rest of the facilities rely on the local chiefs, community volunteers and the traditional birth attendants' birth registries to obtain such information. However, it is difficult to judge the extent of the strength and how systemic this relationship is.



Although HU have set targets, they were not set taking into account previous years performances, but out of directives and numbers set at a higher level. This has meant that some of the facilities presented coverage rates of over 100%. Most facilities also did not keep tabulations for their performance for other antigens aside from DTP and measles.

Drop-out rates, although monitored and up-dated, did not seem to be used to establish strategies or to follow-up defaulters except in Migori district despite the meagre increase in immunization coverage (though expected to pick up as the CDC supported project is relatively new). Additionally, many facilities had negative drop-out rates, some had over 10% for DTP (the recommended maximum for this antigen), and over 25% for measles (the national average for this antigen), without these results being questioned.

3.5 Core indicators

3.5.1 Vaccine Safety

Syringe supply is properly monitored at National level. However, at district level only two of the four districts had functioning syringe ledgers. At HU level, syringe ledgers are practically non-existent. HU just maintain a record of receipts of syringes. Even though safety boxes are not registered in any ledger, they were sufficiently available in all HU, and consistently used.

AEFI Surveillance: it was possible to find, at some facilities, forms for AEFI surveillance. However, the format is being discussed at the National level to accommodate other relevant information, and the non-existence in the rest of the facilities visited is the main reason for not using them.

3.5.2 Wastage

Wastage rate refers to the proportion of doses of vaccines that are in the system but that will never reach a child. Wastage may be due either to unopened vials that get expired, broken or lost vials (unopened or system wastage) or doses in opened vials remaining after vaccination sessions, which are no longer usable. Global wastage refers to the combination of both and is possible to calculate at the HU level only. To estimate vaccine wastage rate for a given vaccine in a given period of time we need two sets of information: the number of doses actually administered during this period of time and the total number of doses delivered, but not held in stock.

Global wastage: It was not possible to estimate the global wastage rate (opened and unopened) at the selected health units because only a maximum of two HU per district had the complete and necessary data on vaccines stock management (complete ledger books) and the total number of doses administered (see table 7 below)

Unopened wastage: Wastage occurring within the vaccine stores due to losses of unopened vials can only be estimated if such data is registered in the vaccines stock management ledgers. Therefore, as ledgers at district and national level failed to register unopened, lost and expired vial, wastage could not be estimated for any of the four districts and neither for national level (see 7 below). Wastage calculations, thus, shows 0% wastage for both national and district level. This number cannot be taken as entirely accurate, as only when unopened wastage (breakage, loss or missing after recount, expired, failure of cold chain) is clearly registered in the ledgers (even if at the end of the reporting period the number is equivalent to 0) the end percentage of wastage can be taken as accurate.



Table 7. DQA Vaccine Wastage Rates (Weighted Means)

	Dagoretti	Kitui	Migori	Uasin Gishu
District WR (unopened)	NA	NA	NA	NA
Average WR for HUs (opened and unopened) ¹	NA Calculation possible for one HU WR 13,6%	NA Calculation possible for three HU WR 52,9% to – 0,9%	NA Calculation possible for two HU WR 7,7% to – 47,7%	NA Calculation not possible for any HU

National WR (unopened): NA

Weighted Mean of the 24 HU wastage rates: NA

3.5.3 Completeness of Reporting

At National level the completeness of reports has increased from 86.8% in Audit Year 2001 to 99.9% for Audit Year 2003. The report completeness for the selected districts was of 100% both at national level and at district level.

At district level the average report completeness is 83.9%. The average for the Selected HU, however, was higher, reaching 92.36%. Comparatively, the report completeness found at HU level averaged 98.26%. These figures may be, on the one hand, a reflection of the poor results for the storing component (see above), and on the other hand, the result of the infinite and non-official processes of getting a report from the HU to the district. It is likely that some of the reports are “lost” due to un-official reporting process.

Table 8. Report Availability District Average

District	at District Total HU	at District Selected HU	at Selected HU
Dagoretti	77.24	93.06	97.22
Kitui	90.59	97.22	100.00
Migori	80.85	86.11	95.83
Uasin Gishu	86.90	93.06	100.00
Average	83.90	92.36	98.26

3.5.4 Other Core Indicators

DTP3 coverage at district level were slightly lower in all districts except in Dagoretti district. This is due to differences in all four districts between national and district figures for both DTP3 doses and denominators.

Drop out rates for DTP<1 to DTP3<1 were the same at the national and district levels. The drop-out-rates were 13%, 9%, 36% and 11% for Dagoretti, Kitui, Migori and Uasin Gishu respectively. The high drop-out-rates particularly in Migori was found due to much emphasis on strengthening management systems at the expense of increasing immunization coverages.

Reports sent: 48 coverage reports were sent to the National level from the four selected districts. This was confirmed at both levels.

¹ Weighted mean of the 6 HUs in that district. Note beginning balance + receipts – ending balance = total use. Total units used (at all 6 HUs)/Total wasted (at all 6 HUs) = weighted mean for district



Vaccine stock-outs: All district had stock outs of BCG and DTP for a period of almost two months in 2003.

Supervision: Intensive supervision supported by documentary evidence in the KEPI supervisory visit book was conducted to all districts in 2003.

Action plans: All districts had annual and quarterly action plans. The districts have vibrantly taken the initiative to the health units where action plans were posted on the walls.

3.6 Changes Since last DQA

The Kenyan Government, in particular the MoH through KEPI has taken inspirational steps towards addressing the recommendations of the previous two DQAs. Notable developments which have contributed to the encouraging result of the verification factor from 0.50 to 0.86 include:

- Proper filing and storage of reports and tally sheets.
- Finalization of the development and dissemination of guidelines and policy documents which include the Immunization Performance Monitoring Handbook and the Vaccination
- Regular supervision and feedback to the lower levels which is well documented at the HU level in the KEPI supervision book stored at the HU level.
- Effective linkages with the communities with HU staff and volunteers using the data from permanent registers to trace defaulters. A defaulter tracing form is available.
- Performance monitoring has been enhanced with the national, district and HU levels having posted up-to-date immunization performance charts.
- KEPI has developed a comprehensive data collection tools that allows monitoring of stock outs and wastage though currently not effectively not used.

However, it is important to note that despite these encouraging developments, much focus has been on systems development and improvement without checks on the immunization coverages which are the prime factor for all these efforts. As such, in most HU and the districts as a whole, while they performed well in the quality of the system index, coverages have drastically reduced with some even achieving negative results.

4 RECOMMENDATIONS

4.1 Priority recommendations

- Introduction of ledgers for monitoring syringes and general supplies.
- Support and strengthen HU staff capabilities in setting targets based on past achievements, monitoring wastage, coverage (not only for DTP and measles) through on-the-job-training (OJT). The PMH and VMG are resource materials for the OJT.
- That systems have been developed and are functioning but with dwindling immunization coverages, it is important to review the strategies that could support increased immunizations.

4.2 Other recommendations

National Level

Recording

- KEPI should consider to include syringes and other supplies in the computerised vaccine stock control system.



Storing/Reporting

- Consideration should be taken to make weekly back-ups of computer files (as opposed to the current monthly back-ups).
- KEPI should ensure that the ongoing upgrading of the computer network is finalised.

Monitoring/Evaluation

- Monitoring of Vaccine wastage is well described in the KEPI/WHO publication: Vaccine Management Guidelines, so national level should emphasize the importance of updated, complete ledger books of stock management, both at National and district level. They have the report forms with space for reporting wastage, to be used both at HU and at districts. The National level should start integrating wastage into the KEPI database.
- There is need to have a discussion about feedback data for staff to know how they are performing and about necessary changes.
- Print outs and publications should consistently be dated.

Demographics and planning

- The national level and districts should find a mechanism to harmonise denominators.

System Design

- KEPI and the HMIU in the MoH should forge ahead with discussions to integrate immunization data into the national HMIS.
- The revision of the AEFI forms should be hastily finalized, forms distributed and health workers oriented on all required procedures regarding how to deal with an AEFI.
- Written back up instructions should be made available to all health institutions.

District Level**Recording**

- Ledgers for monitoring syringes and general supplies should be implanted in all districts

Storing/Reporting

- Formalise, document and implement written backup procedures for computerised districts
- Print outs and publications should consistently be dated.

Monitoring/Evaluation

- There is need to strengthen wastage monitoring, stock-outs and coverages of other antigens apart from DTP and measles.

Demographics and planning

- HU should be supported in developing strategies which reflect immunization per strategy type (static, outreach, mobile etc)

HU Level**Recording**

- Ledgers for monitoring syringes and general supplies should be implanted in all HUs

Storing/Reporting

- Static and outreach data tally sheets should be properly stored. All outreach data filled forms for each particular month should be attached to the static form on that particular month for easy retrieval when compiling summaries.



- Each outreach station should use its own tally sheet.
- HU staff should avoid using same tally sheet for more than one month.

Monitoring/Evaluation

- Targets should be set based on past performances.
- Wastage data should be carefully and completely monitored
- Introduce ledgers for monitoring syringes and general supplies.



5 ANNEXES

Annex I – Key Informants

Health Units by District

Dagoretti	Kitui	Migori	Uasin Gishu
Mbagathi Dist. Hospital	Katulani H/C	Awendo H/C	Moisbridge Catholic
Woodly Clinic	Kanyangi Mission	Oyani H/C	West
Waithaka H/C	Kasyala Disp.	Matoso	Ziwa
Ngong Rd H/C	Tulia H/C	Karungu	Family Med.
Mid-Hill Clinic	Kisasi H/C	Nyakuru	Ngenyilel
Gichuru Med Clinic	Miambani H/C	St. Camillus	Sergoit Med. Clinic

Dagoretti

Name	Position
Dr. Isabella Yonga	District Medical Officer of Health
Angela Njiru	District Public Health Nurse – Pumwani District
Samson Wainaina	District Health Records Information Officer
Joan Muchuin	District Disease Surveillance Officer
Rosemary Ngogio	District Public Health Nurse
Helen Karanja	Deputy District Public Health Nurse
Susan N. Muhoro	Provincial Medical Officer Office
Florence W. Kabuga	Provincial EPI Logistician

Kitui

Name	Position
Dr. Musyova David Mutiso	District Medical Officer of Health
Joseph Chege Kariri	District Health Records Information Officer
Johnson N'Muinde	District Public Health Officer
Richard M. Luusa	Public Health Officer
Anthony K. Mwanthi	District Disease Surveillance Officer
Jenifer S. Kingole	District Public Health Nurse
Paul Njagi Ruthan	Provincial EPI Logistician

Migori

Name	Position
Dr. Gonchi J. O.	District Medical Officer of Health
Ms. Ajuoga	District Public Health Nurse
John O. Agwatty	District Health Records Information Officer
Joshua O. Omolo	District Public Health Officer
James Odeyo Waswala	District Health Administration Officer
Clementine Gwonswar	Provincial EPI Logistician

Uasin Gishu

Name	Position
Dr. D. Roiku	District Medical Officer of Health
John Kipromo	District Public Health Nurse
David K. Korir	Deputy District Public Health Nurse



Joel Tanui	District Health Records Information Officer
Michal Mwasame	District Disease Surveillance Officer
CalebA. Otichilo	Deputy District Public Health Nurse
Mr. Kigen	Provincial EPI Logistician

National Level

Name	Position
Dr. T. Kamau	Kepi Manager
Titus Kolongei	Data Officer
Amina Ismael	National Kepi Representative
Josephine Odanga	EPI Surveillance
Peter Ademba	Data Manager
Dr. Ali Arale	Deputy Kepi Manager
Ali Hassan	Deputy Data Manager
Dr. Alfred Keyamito	UNICEF – EPI Health Proje Officer
Dr. Emanuel Taylor	WHO
Debriefing	
Name	Position
Titus Kolongei	DPHC – KEPI
Timothy Mbaka	DPHC – KEPI
Amina Ismael	DPHC – KEPI
Josephine Odanga	MOH – KEPI
Michelle Folsom	PATH
Rose W. Kuria	MOH – DOM
Joseph MN. Slekiu	MOH – CM
Sheila Macharia	USAID
Peter A. Adembu	MOH – KEPI
Dr. Ali Arale	MOH – KEPI
Mohamed P. Duale	WHO K.C.O.
Willie Nyambati	JICA
Rudy Eggers	WHO ICP KEPI
Dr. Tatu Kamau	MOH – KEPI
Dr. A. Misore	MOH – HPPHC
Dr. Iyabo Olusainuir	UNICEF
Dr. Alfred Kenyanito	UNICEF
Dr. John Ogange	WHO – EPI
Dr. Charles M. Nzioila	MOH – DOMV



Annex II – Quality Index Analysis Tables

District Quality Indices and District average (over 5)

	Recording	Stor/Repo	Monitoring	Demo/Pla
Dagoretti	5.00	5.00	3.50	4.00
Kitui	5.00	2.86	4.09	4.00
Migori	4.44	2.86	4.55	4.00
Uasin Gishu	5.00	3.75	3.50	3.89
District Average	4.86	3.62	3.91	3.97

HU Quality indices and HU average (over 5)

	Dagoretti			Kitui			
	Record.	Stor/Rep.	Mon/Eval	Record.	Stor/Rep.	Mon/Eval	
Mbagathi Dist. Hospital	4.33	3.75	3.33	Katulani H/C	4.33	5.00	4.44
Woodly Clinic	4.00	5.00	3.33	Kanyangi Mission	4.67	5.00	3.89
Waithaka H/C	4.33	5.00	3.89	Kasyala Disp	4.33	5.00	4.44
Ngong Rd H/C	4.33	5.00	3.33	Tulia H/C	4.00	5.00	5.00
Mid-Hill Clinic	3.75	3.75	3.89	Kisasi H/C	4.33	5.00	4.44
Gichuru Med Clinic	4.33	3.75	2.78	Miambani H/C	4.33	5.00	3.89
HU average	4.18	4.38	3.43	HU average	4.33	5.00	4.35

	Migori			Uasin Gishu			
	Record.	Stor/Rep.	Mon/Eval	Record.	Stor/Repo	Mon/Eval	
Awendo H/C	4.33	5.00	4.44	Moisbridge Catholic	3.67	5.00	5.00
Oyani H/C	4.67	5.00	4.44	West	4.00	3.75	5.00
Matoso	3.67	5.00	5.00	Ziwa	4.00	5.00	4.44
Karungu	4.67	5.00	4.44	Family Med.	4.00	5.00	5.00
Nyakuru	4.00	3.75	3.89	Ngenyilel	3.67	5.00	5.00
St. Camillus	4.33	5.00	5.00	Sergoit Med.Clinic	3.33	5.00	5.00
HU average	4.28	4.79	4.54	HU average	3.78	4.79	4.91



Annex III – Core Indicators Tables

Core indicators at National level

	JRF	Reported at time of audit
Districts with DPT3<1 coverage > 80%	73.6%	72.0%
Districts with measles<1 coverage > 90%	52.8%	54.2%
Drop-out rate	NA	15.8%
Type of syringes	Disposable Syringes	Disposable Syringes
Districts with AD syringes	0	0
Introduction HVB	NO	NO
Introduction Hib	1 st October 2001	1 st October 2001
Vaccine wastage DPT	5 – 20%	30%
Wastage rate HVB	NA	NA
Wastage rate Hib	5 – 20%	NA
Interruption in vaccine supply 2003		1.5 months
Number of Districts with interruption in vaccine supply 2003	NA	NA
% District disease surveillance reports received/expected	Not monitored	Not monitored
% District coverage reports received/expected		100%%
% District coverage reports received on time		NA ²
Number of District supervised at least once in 2003		100%
Number of Districts which supervised all HUs in 2003	100%	NA
Number of Districts with microplans including routine immunisation	100%	100%

² District reports sent to provinces which aggregate and then send to national level. District timelines not recorded at National level.



Core Indicators at District level

		Dagoretti	Kitui	Migori	Uasin Gishu
District DPT3 coverage	At national	127.0%	69.0%	44.0%	84.0%
	At District	127.0%	70.8%	71.6%	88.7%
District measles coverage	At national ³	116.0%	60.0%	40.0%	70.0%
	At District	118.0%	61.6%	38.7%	72.4%
District Drop-out DPT1-3 ⁴	At national	13.0%	9.0%	36.0%	11%
	At District	18.0%	7.3%	36.7%	12.0%
Syringes supplied in 2003	At national	9,600	52,200	65,200	-
	At District	NA	126,800	NA	137,900
Number of District coverage reports received/sent	At national	12/12	12/12	12/12	12/12
	At District	12/12	12/12	12/12	12/12
Number of coverage reports received on time/sent on time	At national	11/12	7/12	8/12	12/12
	At District	NA	NA	NA	NA
Number of HU coverage reports received/sent	At national				
	At District		587/648	577/564	949/1092
Number of HU reports received/sent on time	At national				
	At District		562/648		NA
District vaccine stock out	At national	Yes	Yes	Yes	Yes
	At District	Yes	Yes	Yes	Yes
Has the District been supervised by higher level on 2003	At national				
	At District		Yes	Yes	Yes
Has the District been able to supervise all HUs in 2003	At national				
	At District		Yes	Yes	Yes
Did the District have a microplan for 2003	At national				
	At District	Yes	Yes	Yes	Yes

³ Information not collected at national level.

⁴ Unable to estimate due to the fact that the HMIS does not routinely collect DPT1 data.

