



THE GLOBAL ALLIANCE FOR VACCINES & IMMUNIZATION

REPORT ON THE 2003 DATA QUALITY AUDIT (DQA) OF THE YEAR 2002

KINGDOM OF NEPAL





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Introduction

From September 1 to 14 of 2003, PricewaterhouseCoopers performed the first GAVI Data Quality Audit in Nepal. Together with a team of internal auditors from the national EPI office, we assessed the quality of EPI data and systems and audited the reported number of doses of DTP3<1 administered in the Nepalese fiscal year 2058-2059 (corresponding to the period from July 2001 to July 2002 as this is consistent with the reported period in the Joint Reporting Form).

The audit was based on a random sample of health care administrations, including:

- The national EPI administration and central office of the Health Management Information System.
- Four district level administrations: Siraha, Kavre, Kapilvastu and Dadeldhura. These districts were randomly sampled from the list of 41 eligible districts. Thirty-four other districts were considered non-eligible because of security reasons (either UN phase III or deemed non-secure by MOH officers because of insurgency). See below map of Nepal indicating non-eligible districts.







- Nine Illaka administrations, the level between districts and health units, which were treated in the DQA as "sub districts". In every district, 2 Illakas were randomly selected, but in Dadeldhura it was necessary to select 3 Illaka as most of the Illakas in this district have less than 3 Health Units apiece. Twenty-nine out of the 54 Illakas in the selected districts were deemed ineligible because of security concerns and in a few cases because they had less than three health units.
- Twenty-four health units (3 in every Illaka, including hospitals, health units and any other facility where immunizations are administered).

The findings of this audit are included in this report and were also discussed on a debriefing meeting with the ICC on September 29, 2003.



Summary of findings and conclusions

The audit of the accuracy of reported DTP3<1 in 2002 was calculated by recounting the DTP3<1 in the immunization register, as tally sheets were not in use except in 7 Health Units. This Verification Factor was 83%, above the 80% threshold set by GAVI. The system and the data it produces were therefore deemed reliable.

As for the quality of the system, our findings indicate that the Quality of the System Index (QSI) is better at the central levels and district level than at the health unit level:

- QSI at the national level: 87%
- Average QSI for 4 districts : 82%
- Average QSI for 24 health units: 79%

The scores for the Districts Siraha and Kapilvastu were better than those for the district s Kavrepalanchok and Dadeldhura

We believe that a major improvement in terms of data availability will be achieved once the EPI administration has implemented its new reporting system, which will provide Health Unit information to District levels. The verification factor could be expected to improve as well, as the use of tally sheets shall be mandatory from this year on.

Please note that, while we think that these results adequately represent the situation in the selected health administrations, they may reflect a certain under-weighting of remote and peripheral areas as many of these were excluded from the sample.



National context

The national EPI office belongs to the department of Child Health Care, which forms part of the Ministry of Health. It is relatively small as an independent unit, but since the EPI works closely together with other departments and with UN agencies, as many as 50 people are involved in EPI activities at the central level. Continuously, initiatives are taken to improve performance. This has led to enhancements in coverage, drop-out and wastage rates in the past few years.

The information system for the programme is fully integrated with the ministry's overall Health Management Information System (HMIS). Apart from collecting and publishing data, this department also closely monitors data quality, both in the daily operations and through annual data verification audits in all districts. HMIS publishes an excellent and comprehensive annual report, which includes, for the EPI, raw data about coverage, drop-out and report completeness, as well as an analysis of programme performance.

Acknowledgements

We would like to take this opportunity to express our appreciation for the co-operation and courtesy afforded to us during the DQA. We especially would like to thank Dr. Shyam Mishra (Chief EPI Division), and Dr K.B. Gharti (In-country immunization officer, GAVI).



Background

Objectives of the DQA

The overall goal of the DQA is to ensure that management of immunization services and the allocation of GAVI funding are based on sound and accurate data. This goal is met by:

- Assessing the reliability and accuracy of administrative Immunization Reporting Systems, but not immunization service delivery.
- Auditing the reported DTP3<1 vaccinations for the audit year 2002 and estimating the national verification factor (ratio of recounted / reported vaccinations) for use in the allocation of GAVI Fund shares.

The above objectives are achieved by examining data and the information system in operation at all levels of administration – from collection of data at the point of vaccination to the periodic compilation of this data at district level and at National headquarters. This is done on the basis of randomly sampled administrative levels.

Furthermore, in practice the DQA is also a capacity-building exercise, and an opportunity for exchange of experience between the external auditors and the national counterparts.

Our approach

Our approach was to apply consistently the DQA methodology developed in 2000 by the World Health Organization (WHO).



The PwC team members were from our local office, in the interest of cultural and linguistic proximity, acceptance by auditees, ease of travel, and cost-effectiveness. PricewaterhouseCoopers is a federation of partnerships, and we have therefore worked through this network in order to build up our teams.

In preparation for the DQA, we applied country-by-country training, in which the quality assurance manager for the region travelled on-site to train both the PwC team and the national counterparts appointed by the government. We used this training option in the spirit of the DQA, so that it not only provides objective results to GAVI and its stakeholders, but also enforces the capacity-building aspect of the DQA.

Summary of work done

Two audit teams were formed, comprising one PwC auditor and one national auditor. The teams worked together at National level and then split up, each visiting 2 districts and, in turn, each visiting 12 health units per district.

We carried out the tasks detailed in the DQA methodology, which included among others:

- Random selection of 4 districts and 24 health units (see above our explanation of the intermediary level "Illakas", treated as sub districts).
- Discussion of the immunization system in place including system design (national level only), denominator issues (national and district levels only), recording, reporting and storage practices, monitoring and evaluation
- Recount of vaccines administered for DTP3<1 (at least) at health unit level, and comparison of recorded with reported figures at all administrative levels
- Review of the cold chain at all administrative levels
- Review of vaccine supply and stock procedures in place
- Review of the procedure for reporting and investigating Adverse Effects Following Immunization (AEFI) at all administrative levels
- Performance of the Child Health Card exercise or observation of a vaccination session



Mobilisation

Prior to commencement of the DQA, PwC briefed officers of the Expanded Programme on Immunization (EPI) and Ministry of Health (MOH on the objectives, purpose and methodology of the exercise. During the same sessions, the EPI and MOH briefed the PwC auditors on the national context, including major public health and vaccination and immunization issues and policies.

The team for the Nepal DQA was composed of:

Name	Title	Location
MOH Officer		
Parashu Ram Shrestha	Sr. Public Health Officer	National level and Districts
Shree Krishna Bhatta	Sr. Public Health Officer	National level and Districts
External Auditors		
Manoj Karki	PWC, External Auditor	National level and Districts
Numanath Poudel	PWC, External Auditor	National level and Districts
Jan Grevendonk	Trainer / QA	National level
District Supervisors		
Bindhev Thakur	EPI Supervisor	Siraha
Narayan K. C.	EPI Supervisor	Kavre
Hari Acharya	Cold Chain Assistant	Kapilvastu



	, 	
Baburam Acharya	Health Inspector	Kanilyastu
Daburani Acharya	ficalul hispector	Kapiivastu
Rambrichna Danthi	ΛЦW	Kanilyastu
Kalliki Ishila Talitili		Kapiivastu
		_
Dil Dohodur Shahi	EDI Supervisor	Dedaldhure
Dii Dailauui Silaili	EFI Supervisor	Dauelullula
	•	

The Logbook provides the details of individuals visited during the DQA.

National – findings and recommendations



Strong points

From a data quality point of view, the EPI programme benefits greatly from the work done in the HMIS. The HMIS department has been operational for 10 years in close co-operation with the UNFPA. It is widely regarded for its high quality work; it is autonomous, led by a senior officer, and takes ownership and responsibility for data quality while the respective programmes and departments can focus on monitoring and improving performance. System design, storing, reporting and recording can all be considered strong points at central level.

Monitoring and evaluation is a continuous process in Nepal, with an annual highlight in the regional review meetings. Currently, within the EPI programme an initiative is being developed to prioritise efforts, and classify the districts based on access and utilization criteria. Similarly, all health units will be given a priority indicator from 1 to 4, and districts will take responsibility for the performance in their health units

Areas for improvement

- 1) There is no system to monitor Adverse Effect Following Immunization (AEFI).
- 2) The movements of vaccines are not monitored with reference to batch number and expiry date; however, the department is considering implementation of the same.
- 3) Monitoring and supervision should be carried out at regular intervals and standard feedback formats for this purpose should be developed.
- 4) A written Data Recovery Procedures (DRP) should be developed and regular back-ups should be maintained to safeguard the data.



Information/data flow and organisation of EPI for the country

The HMIS works through a decentralised system, as each level supervises only the next lower level, and generally, only information about this next lower level is available.

The monthly reporting process starts with the health worker. Each health worker is responsible for a certain area and maintains the register for that area. Before the 3rd of each month, he or she will collect information from the register (no tally sheets are used), and submit a report with that month's activities to the Health Post (HP), Sub Health Post (SHP) or PHC to which he or she belongs. This health unit will then compile an aggregated report for its Illaka. There is one HP or PHC per Illaka and one SHP, HP or PHC per community.

The Illaka will gather all information from all the HP, PHC or SHP under its responsibility and send a report to the district office before the 7th of each month. Apart from the Illaka reports, the district may also receive reports directly from the district hospital or the NGOs that operate in the district.

Before the 12th of each month, the district office prepares a monthly report for the central level, and also sends a copy to the region it belongs to. The reports are then processed in the HMIS central office, and the results are shared with the respective departments.

Every year, before the publication of the annual report, internal auditors visit all district level offices for data verification at district level.





Verification Factor

The verification factor is calculated based on data collected during the DQA and is a measure to verify the reported performance at national level. It compares the number of doses recounted from the health unit immunisation registers or tally sheets to the numbers that were reported to the higher levels. Overall, a verification factor of **83%** was calculated, with a 95% confidence interval from 61% to 105%.

No variances were observed in tabulations at national, district and Illaka level for any of the selected districts. Illaka wise tabulations were found at all districts, and HU tabulations could be found in all Illakas.



It was possible to recount from either the tally sheets or child registers in all selected health units. In 17 health units tally sheets were not used, and the data was verified by recounting the immunization register. In the remaining 7 health units tally sheets were available. In two instances only tally sheets but no immunization register was available. In two health units in Kapilvastu we could not find an immunization register for the first 3 months so we could not recount the reported DTP3<1.

The main problem for the verification factor in this DQA was therefore inconsistency between the recounted vaccination data from the immunization register and data reported to the district, as well as, in the cases mentioned above, non-availability of immunization registers.

No indications were found that data was deliberately altered to improve the reported numbers.

Quality of the System Index

QSI at national level:	87%
Recording practices	4.17 / 5.0
Storing and reporting	4.00/ 5.0
Monitoring and evaluation	4.72/ 5.0
Denominator	4.00 / 5.0
System design	4.23/ 5.0

<image>

System design (score: 4.2 / 5.0)

Issue observed	1. There is no system of reporting any cases of AEFI.
	 Monitoring of the movement of the vaccines is not done as per batch number and the expiry date of the vaccines.
Recommendation	1. Introduction of AEFI information in the monthly report.
	2. Monitoring of the movement of the stocks using batch number and expiry dates helps to detect the movement at a glance.
EPI management comments	 Guidelines for AEFI surveillance have been approved. Operational work plan is in process.
	2. System exists, emphasis will be given to proper vaccine movement according to batch number and expiry date.

Denominators (score: 4.0/ 5.0)

Issue observed	 No breakdown of infant immunizations was known between fixed, outreach and mobile strategy.
Recommendation	 Knowing the percentage of infant immunizations per strategy would be helpful for the EPI management to focus resources.



EPI management comments	1.	During regular immunization, target group is fixed type, during campaign mobile and fixed type.
	2.	Target is fixed for <1 year infant and aim is 100% coverage. MLM training, orientation, micro-planning is a ongoing program

Monitoring and Evaluation (score: 4.7 / 5.0)

Issue observed	 There was no up to date monitoring chart of table of the current year's immunization coverage and drop out rate displayed in the EPI office. Supervision is not monitored properly, and there was, for example, no data on the number of districts supervised in 2002.
Recommendation	 A chart or table monitoring the current year's immunization coverage and drop out rate should be made and displayed in the relevant office, room etc. Supervision activities should be planned for and monitored. Data received from districts should be thoroughly analyzed and proper feedback should be given.
EPI management comments	 All information is available in the district profile , and recently, monitoring tools as per WHO recommendation for routine immunization, coverage and dropout rate have been developed. It will be made mandatory for display. Supervision is regularly done from central, regional and districts level and reporting is being done on regular basis to the center.

Vaccine wastage rates

No system wastage was reported at national or at district level. Total national DTP wastage stands at 24%. This

has come down significantly since an "open vial" policy has been adopted, but further improvement can be expected to be limited, because many of the doses are still administered during outreach sessions.

The vaccine wastage for DPT of the four districts visited was:

Siraha	22.4%
Kavre	32.7%
Kapilvastu	21.8%
Dadeldhura	26.2%

In most instances, the officer in charge of the health unit knew how to calculate the vaccine wastage rate and was calculating and monitoring it monthly.

Reporting Adverse Effects Following Immunisation (AEFI)

No system is in place for reporting AEFI on a routine basis.

Availability and completeness of reports

Completeness of reporting is closely monitored at the central level. The system allows for the calculation of completeness not only of district reports, but also of the reports from the lower level upon which they are based. Before closing the year and publishing the annual report, HMIS officers make sure that no reports are missing.

District report completeness at national level for the audit year was 100%. All reports for the audit year for the selected districts were available at the time of the audit.





Health units (including NGOs and hospitals that report directly to the district) regularly submit their monthly reports, but actual time and date of receipt were not recorded either at district level or at Illaka level. Overall 99% of the HU reports were available at Illakas and 98.96% of the Illaka reports were available at district.

Health units were reporting to Illakas within the 3rd day of the following month and reports that are not submitted are included in next month's reports. 100% of the reports were available at the health units.

District – findings and recommendations



District context

Four districts: Siraha, Kavrepalanchok, Kapilvastu and Dadeldhura, were selected out of the total 75 in the country. The total reported DPT3<1 of these selected districts represents 7.31% of national data. Nine Illakas were selected. Three Illakas were selected in the Dadeldhura district as most of the Illakas in that district have less than 3 Health Units, thus making them ineligible for the HU sampling. Twenty-four health units were sampled in the selected Illakas. Due to security reasons many Illakas were ineligible, as shown in the table below:

District	Total Illakas	Ineligible	Eligible
Siraha	17	10	7
Kavrepalanchok	17	12	5
Kapilvastu	10	4	6
Dadeldhura	10	3	7

Quality of the System Index

Average QSI at District level:	82% (range between 76% and 91%)
Average score recording:	4.19 / 5.0
Average score storing and reporting:	3.51 / 5.0



Average score monitoring and evaluation:	3.98 / 5.0
Average score demographics and planning:	4.50 / 5.0

Recording

Issue observed	1. No date is stamped or written the HU reports as they are received at district level.
	 Recording of vaccines received and issued is not monitored as per Batch Number and expiry date of vaccines.
No of districts in	4
which observed	
Recommendation	1. District staff should promptly write the date of report received, which will make it easier to identify the final report version.
	2. Montoring of the vaccines should be done taking into the account Batch number and the expiry date.
EPI management	1. System exists, maybe in some cases slagness is there and will be rectified.
comments	2. System exists, and will be rectified.

Storing & Reporting

Issue observed	Data are processed manually, resulting in time consuming reporting process.



No of districts in	3
which observed	
Recommendatio	Computers should be used for data processing purpose.
EPI management comments	Capacity building, trainings are in process for data processing and logistics support.

Denominators

Issue observed	The proportion of infant's immunizations per strategy type is not set up for the district level.
No of districts in which observed	4
Recommendation	The percentage of infant immunizations should be known for each type of strategy
EPI management comments	The targets for immunization are already fixed through HMIS for each district.

Monitoring and Evaluation

Issue observed No monitoring of health unit vaccine wastage, though the calculation are made regularly
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No of districts in	4
which observed	
Recommendation	Vaccine wastage should be recorded and monitored.
EPI management	Orientation of VHWs and EPI supervisors for vaccine management and its utilization is
comments	given and is an ongoing process. Monitoring is strictly followed.



Health Units – findings and recommendations

Health Unit context

Health units report to the Illaka, which aggregate the reports received from all the units under its supervision. Health units also receive their vaccines from Illakas on the day of immunization and the leftovers are returned to the Illakas after the completion of immunization as the health units does not have the necessary infrastructure to store the vaccines.

Quality of the System Index

Average QSI at health unit level:	79% (range between 64% and 93%)
Average score recording:	3.87 / 5.0
Average score storing and reporting:	3.54/ 5.0
Average score monitoring and evaluation:	4.28 / 5.0



Recording		
Issue observed	1.	No tally sheets were used for recording immunizations, only recorded in Child Register.
	2.	Child and mother registers are kept by village office, and there is no record of the number of target immunization of individual village maintain in the HU office.
	3.	Child's vaccination history cannot be easily and rapidly retrieved in the registers.
No of health units in which observed	17/24	
Recommendation	1.	Tally sheet should be used and archived by HU staff for recording of the number of immunizations for the period, as this form is the initial source of information for reporting purpose.
	2.	Child and mother registers should be kept in the HU and properly filed.
	3.	Child's vaccination history should be recorded and maintained properly for easy and rapid retrieval in the register.
EPI management comments	1.	Routine recording system is very much reliable. Tally Sheets are used only during campaigns.
	2.	There is fixed target setting for immunization
	3.	Immunization card it self revels the Child Vaccination History

Storing and reporting

Issue observed	No properly organized filing of HU reports due to lack of proper filing cabinets.
No of health units in which observed	24
Recommendation	An orderly filing system should be set-up as a matter of priority
EPI management comments	System exists, if any deficiency that can be rectified

Monitoring and evaluation

Issue observed	1.	No vaccine wastage calculated and monitored.
	2.	No immunization coverage and drop-out rates calculated and monitored.
	3.	No mechanism in place to track defaulters.
No of health units in	16/24	
which observed		
Recommendation	1.	Immunization coverage rates and drop-out rates should be calculated at least once a year to evaluate HU performance and future planning
	2.	HU should have mechanism / procedure to track defaulters. (Check registers, tickler file etc.)





EPI management	1.	System is existing that can be rectified
comments	2.	Districts mangers are given MLM training, HP in-charges also will be given training accordingly. Immunization Coverage and drop-out rates is being calculated and monitored.
	3.	Immunization card system to be improved. Ward wise register will be updated.

Drop-out rates

Though the officers in charge of the health units were able to calculate drop-out rates, it was observed that they were not calculating it on a regular (eg. monthly) basis. An overview of the reported drop-out rates in the selected districts and Health Units is given below:

SIRAHA	14%	KAVRE	4%	KAPILVASTU	12%	DADELDHURA	9%
Bidhya Nagar	-4%	Ugrachandi	6%	Sirsihawa	-7%	Rai(Shahasralink)	8%
Pipra	12%	Subba Gaun	0%	Ramnagar	20%	Ghatal	-22%
Pokharbhinda	10%	Thaukhal	-6%	Krishnanagar	12%	Navadurga	-2%
Golbazzar	7%	Pachkhal	9%	Jayanagar	-1%	Mastamandu	-65%
Phoolbaria	14%	Shatii Bhagwati	21%	Mahendrakot	4%	Ugratara	-12%
Chandra Ayodhapu	6%	Hokse	6%	Barkalpur	6%	Samaiji	7%



Coverage/change in DTP3 reported

Coverage was not calculated in many Health Units. DPT3<1 for 23 health units increased by 16.39% in the year 2001-2002 (Total DPT3<1=3615) as compared to the year 20000-2001 (Total DPT3<1=3106).

Reported data are verified by the internal auditors at the health units levels and the reports made available to us were the corrected ones after the verification, but in Mastamandu sub health post of Dadeldhura district health unit reports were not corrected though district tabulation was corrected.

Other issues

The EPI office at national level issued instructions to the selected districts for the audit and accordingly district offices had issued necessary instructions to the Illakas and HP/SHP to support the smooth running of the DQA. At the time of our visit we found charts and tabulations were displayed in a majority of the health units. Many of these were prepared on a single paper sheet for the years 1999/2000, 2000/2001 and 2001/2002. Upon inquiry in several health units we found they had been prepared and displayed for the purpose of DQA only; however, it is a promising sign that the exercise prompted this pro-active approach.

Constraints - timing, logistics & other

Districts selected for the DQA were blighted by security problems. In Kapilvastu district 23 Health Units (Health Posts and Sub health Posts) had been destroyed by fighting and could not be considered eligible. High-level security risks in remote areas of all four districts were the main reason for the most of the Illakas being noneligible for selection. In addition, there was no road access to some Illakas in the Dadeldhura and Kavre districts



and health units in these mountainous areas could not be travelled to within the given time.

Wrap-up

A debriefing to the ICC meeting was given on 29th September 2003. On the same occasion, the EPI Management presented future programmes on immunization and foreseen improvements in the system. The debriefings performed during the audit at the District Health Office and at each Health Unit were very useful for the audit teams to give continuous feedback on improving the quality of reporting, recording, storing, monitoring and the denominator.

Our counterparts, the national auditors, disseminated their immunisation service knowledge to enhance the overall system, giving health unit officers and health workers advice on possible improvements to existing practices.

The audit year was selected for 2001/2002. However the quality questions were answered on the basis of the system existing at the time of the audit, i.e. 2003. On our visit to the districts we found a better system of reporting and data processing existed for the year 2002/2003.

APPENDIX I. CORE INDICATORS – NATIONAL LEVEL

Number of districts in the country:	JRF:75	Reported at the	Comments
		time of the audit:75	

Core indicator	JRF	Reported at the time of the audit
DISTRICTS WITH DTP3 COVERAGE >=80% N	28	28
(ADMIN, DTP3<1) %		5336%
DISTRICTS WITH MEASLES COVERAGE >=90% N	9	9
(ADMIN MEASLES<1) %		16.28%
DISTRICTS WITH DOR < 10% N	48	50
(ADMIN, DOR DPT1 DPT3) %		
Type of syringes used in the country*		Auto Disposable,
		Disposable
		Reusable
% of districts that have been supplied with adequate (equal or more) number of AD syringes for all routine immunizations (less OPV) during the year		Only being used in Campaigns not in routine immunization



Core indicator	JRF	Reported at the time of the audit	comments
Introduction of Hepatitis B (yes /no when/ partially/ specify presentation)*		Na	
Introduction of Hib (yes /no when/ partially/ specify presentation)*		Na	
Country wastage rate of DTP		259%	
Country Wastage rate of Hep B vaccine		Na	
Country Wastage rate of Hib vaccine		Na	
Interruption in vaccine supply (any vaccine) during the audit year at national stock		No	
How many districts had an interruption in vaccine supply (any vaccine) during the audit year		none	
% district disease surveillance reports received at national level compared to number of reports expected (routine reporting of VPD)		100%	
% of district coverage reports received at national level compared to number of reports expected		100%	This is not available



Number of districts which have been supervised at least once by higher level during the audit year	No records maintained	
Number of districts which have supervised all HUs during the audit year	100% monitoring was not carried out in single district.	
Number of districts with microplans Including routine immunization	75	

APPENDIX II. CORE INDICATORS – DISTRICT LEVEL



Indicator	Siraha	Kavre	Kapilvastu	Dadeldhura
District DTP3 coverage N	17,010	9,599	13,326	3,330
(last tabulation available) %	105%	77%	86%	68%
District measles coverage N	14,783	9,372	12,904	3,075
(last tabulation available) %	91%	75%	83%	63%
District drop-out (DTP1-3)	14%	4%	12%	9%
Total immunization given in 2002 (less OPV)	158427	68746	16801	24665
Nr district coverage reports received / sent	12	12	12	12
Nr district coverage reports received on time / sen on time	No date is stamped on the receipt of the report	No date is stamped on the receipt of the report	No date is stamped on the receipt of the report	No date is stamped on the receipt of the report
Nr district disease reports sent (regular VPD reporting)	12	12	12	12
Nr HU coverage reports received / sent	1,343	1,201	928	322



Nr HU coverage reports received / sent on time	No date is stamped on the receipt of the report	No date is stamped on the receipt of the report	No date is stamped on the receipt of the report	No date is stamped on the receipt of the report
Any district vaccine stock-out in 2002?	None	None	None	None
If yes specify which vaccine and duration	Na	Na	Na	Na
Has the district been supervised by higher level in 2002	Yes	Yes	Yes	Yes
Has the district been able to supervise all HUs in 2002	No	No	No	No
Did the district have a microplan for 2002	Yes	Yes	Yes	Yes