A.F.Ferguson & Co

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PRICEWATERHOUSECOOPERS

GAVI

THE GLOBAL ALLIANCE FOR VACCINES & IMMUNIZATION

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

PAKISTAN

PricewaterhouseCoopers is pleased to submit herewith its report on the 2003 DQA by our office in PAKISTAN

Islamabad, September 30th, 2003

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Introduction

A.F.Ferguson & Co, a member firm of PricewaterhouseCoopers, performed the GAVI Data Quality Audit (DQA) of the year 2002 in Pakistan. The DQA was undertaken in Pakistan from September 8 to September 20, 2003. Together with a team of internal auditors from the Federal EPI Cell, we assessed the quality of EPI data and systems and audited the reported number of doses of DPT3<1 administered in the year 2002, through visits to a random sample of health care administrations, including:

- The Federal EPI Cell
- Four District-level administrations: Gujranwala, Sahiwal, Karachi and Upper Dir. These districts were randomly sampled from a total of one hundred and fifteen districts. A refugee camp was deemed non-eligible for this audit.
- Twenty-four health facilities (six in every district, including hospitals, health units and any other facility where immunizations are administered).

In Karachi, there were eighteen towns (DQA “sub-districts”). It was decided to select two towns, and within each town, three health units were sampled through the “sub-district” approach. Further, eight towns were deemed non-eligible for this audit due to security reasons.

Findings of this audit are included in this report and were also discussed in a debriefing meeting with the ICC held on October 11, 2003.

Summary of findings and conclusions

The Verification Factor was 99.1%, which is well above the 80% threshold set by GAVI. The system and the data it produces were deemed reliable. As for the quality of the system, our findings indicate that the Quality of the System Index (QSI) is better at the district and health unit level than at the national level:

- QSI at the national level: 60%
- Average QSI for 4 districts: 80%

Individual QSI for each district:

- Gujranwala 94%
- Sahiwal 80%
- Karachi 78%
- Upper Dir 67%

- Average QSI for 24 health units: 81%

Summary of national findings

- Storing and Reporting
  - There was no written backup procedure for computerized data; further no backup of data was obtained at the national level since May 2003.
- Monitoring and Evaluation
  - Data on the number of districts supervised in 2002 was not available.
  - Vaccine wastage rate was calculated on the basis of a formula defined in PC1 instead of the formula defined in the GAVI Manual. Further, data was not available at national level in respect of health unit wastage (including doses damaged).
  - Up-to-date monitoring charts of the current year's immunization coverage, drop-out rate and reporting completeness were not displayed at the EPI office.

- Denominators
  - The denominator value (for infant immunization) used by the four districts selected was different from the denominator value found at national level.
- System design
  - The EPI reporting system is not integrated with Health Management Information System (HMIS).
  - There was no written procedure for dealing with reports not submitted within the stipulated time.
  - The vaccine ledger book did not contain information in respect of separate batch numbers and expiry dates of vaccines. Consequently, stock could not be monitored according to its expiry date.
- Adverse Effects Following Immunization (AEFI)
  - During the audit year, AEFI were not being reported. However, training activities for the establishment of AEFI surveillance were completed during 2003 and districts were advised to initiate AEFI surveillance.

Summary of findings at 4 districts

- Recording/storing
  - At Sahiwal and Upper Dir districts stock balance information was not available for monitoring HU stock-outs.
  - Date of receipt was not marked on the HU reports found at Sahiwal and Upper Dir districts.
- Monitoring and Evaluation
  - Timing of the health unit immunization reporting could not be monitored at Upper Dir district since date of receipt was not marked on the HU reports.
  - There was no routine feedback format for communication from district level to the next lower level. Supervision was not monitored properly, for example, data on the number of health units supervised in 2002 at Karachi and Upper Dir districts was not available.
  - The format for monthly reporting from health unit to Upper Dir district did not contain provisions for indicating quantity of stock received, issued, damaged and balance in hand. Consequently, health unit wastages were not monitored at Upper Dir district.

- Denominators
  - A static infant denominator had been used since 2001 in Upper Dir district. Further, no targets were set for the number of pregnant women to be vaccinated during the year.
  - There was no set proportion of infant immunizations per strategy type at district level in Sahiwal and Upper Dir districts.

Summary of findings at 24 health units

- Recording/storing
  - Tally sheets for infant immunizations and TT vaccinations were not used for recording at 13 HUs.
  - Stock ledgers were not maintained at 3 HUs. Further, stock ledgers were not updated for DPT and TT vaccine at 10 HUs.
  - Vaccine batch numbers and expiry dates were not recorded in stock ledgers at 5 HUs.
- Reporting
  - Immunization reports for 2001 were not available at 6 HUs.
- Monitoring and Evaluation
  - There was no mechanism in place at 6 HUs to track defaulters.
  - Vaccine wastage was not calculated and monitored at 8 HUs. Further, drop out rates were not monitored at 4 HUs.
  - EPI staff at 4 HUs were not aware of new births in the target area; and at 6 HUs there was no interaction with the community regarding immunization.

Core indicator table

Core indicator		As per Joint Reporting Form (JRF)	As reported at the time of the audit	EPI Comments
Number of districts in the country		117	115	Two districts were combined with two other districts.
Districts with DPT3 coverage >=80% (Admin, DPT3<1)	N	24	22	May be due to counting error.
	%	Na	Na	-
Districts with measles coverage >=90% (Admin measles<1)	N	6	6	-
	%	Na	Na	-
Districts with dor < 10% (Admin, DOR DPT1 – DPT3)	N	28	29	May be due to counting error.
	%	Na	Na	-
Type of syringes used in the country		AD Syringes	AD Syringes	-
% of districts that have been supplied with adequate (equal or more) number of AD syringes for all routine immunizations (less OPV) during the year		100%	100%	-
Introduction of Hepatitis B (yes /no when/ partially/ specify presentation)		Yes	Yes, fully introduced in 4th quarter of 2002	-
Introduction of Hib (yes /no when/ partially/ specify presentation)		No	No	-

Core indicator	JRF	As reported at the time of the audit	Comments
Country wastage rate of DPT	25%	20%	% reduced in new PCI due to change in policy
Country Wastage rate of Hep B vaccine	25%	20%	-ditto-
Country Wastage rate of Hib vaccine	NA	NA	-
Interruption in vaccine supply (any vaccine) during the audit year at national stock		None	-
How many districts had an interruption in vaccine supply (any vaccine) during the audit year	Na	None	-
% district disease surveillance reports received at national level compared to number of reports expected (routine reporting of VPD)	Na	84%	-
% of district coverage reports received at national level compared to number of reports expected	100%	100%	-
% of district coverage reports received on time at national level compared to number of reports expected		100%	-
Number of districts which have been supervised at least once by higher level during the audit year		More than 50%	-

Core indicator	JRF	As reported at the time of the audit	Comments
Number of districts which have supervised all HUs during the audit year	Na	70% to 75%	-
Number of districts with microplans Including routine immunization	Na	Na	-

Na : Not available

NA : Not applicable

National context

The Expanded Programme on Immunization (EPI) started as a pilot project in 1976 and was established nationwide in 1981. The Federal EPI Cell is working under the Ministry of Health (MOH).

The operational level is the Health Unit. Health Unit reports can either be sent /delivered directly to the District level or sent /delivered to the Tehzil /Town (DQA "sub-district") level. At the Tehzil /Town level, they are sometimes aggregated before reporting to the District level. The District level aggregates the data and reports to its respective Province. Provinces compile data for their own use but always send individual District data to the national Institute of Health. The system is in most districts and provinces working in parallel, independently from the existing Health Management Information System.

The reporting system at the Health Unit level is based upon a register system. Permanent Registers are used to record the details of children and women residing in the area. Daily Registers are used to record each vaccination performed and the date and type of vaccination is updated in the entry for the patient in the Permanent Register. Outreach activities are extensive. An important aspect of the immunization programme is the use of Lady Health Workers, who have and will play an important role in reaching the community and motivating mothers to bring their children for immunization.

Denominators for surviving infants and pregnant women are based on a 1998 census. Surviving infants are considered to make up 3.533% of the total population.

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. Rehan Abdul Hafiz, Dr. Altaf Hussain Bosan, Dr. Saleem Ansari and Mr. Qadir Bux Abbassi and all EPI staff at all levels.

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 DPT3<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 predominantly from our local offices, 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 managers for each region travelled on-site to train both the PwC teams 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, visiting two districts each and, respectively, 12 health units.

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

- Random selection of 4 districts and 24 health units
- 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 DPT3<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 EPI on the objectives, purpose and methodology of the exercise. During the same session, the EPI officers briefed the PwC auditors on the national context, including major public health and vaccination and immunization issues and policies.

The team for the Pakistan DQA was composed of:

Name	Title	Location
Federal EPI Cell		
Dr. Rehan Abdul Hafiz	EPI Manager	National level
Mr. Qadir Bux Abbasi	National Auditor	National level
Dr. Altaf Bosan	National Auditor	National level and Districts
Dr. Saleem Ansari	National Auditor	National level and Districts
District Level		
Dr. Mehboob Ali	Asst. Project Director, EPI Sind	Karachi District
Dr. Rahat	District EPI Coordinator	Upper Dir District
Mr. Sajjad Ahmad	District Superintendent Vaccinator	Gujranwala District
Dr. Nusrat	District HMIS Coordinator	Sahiwal District
External Auditors		
Ahmad Zulfiqar Bukhari	PwC Auditor	National level and Districts
Usman Munir	PwC Auditor	National level and Districts
Jan Grevendonk	PwC QA Manager	Training and National level
Karim Rattansey	PwC Manager	Coordination/Reporting National level
S.Haider Abbas	PwC Partner	Quality assurance/Presentation National level

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

National level – findings and recommendations

National context

The reported coverage for DPT3, for surviving children under 1 year old, in the audit year 2002, was 68.6%, which is a reduction from the 75.7% coverage achieved in 2001. The decrease in coverage was widespread in the country, as there was a corresponding decline in the number of districts having a coverage over 80%. This number decreased from 38 in 2001 to 18 in 2002.

Strong points

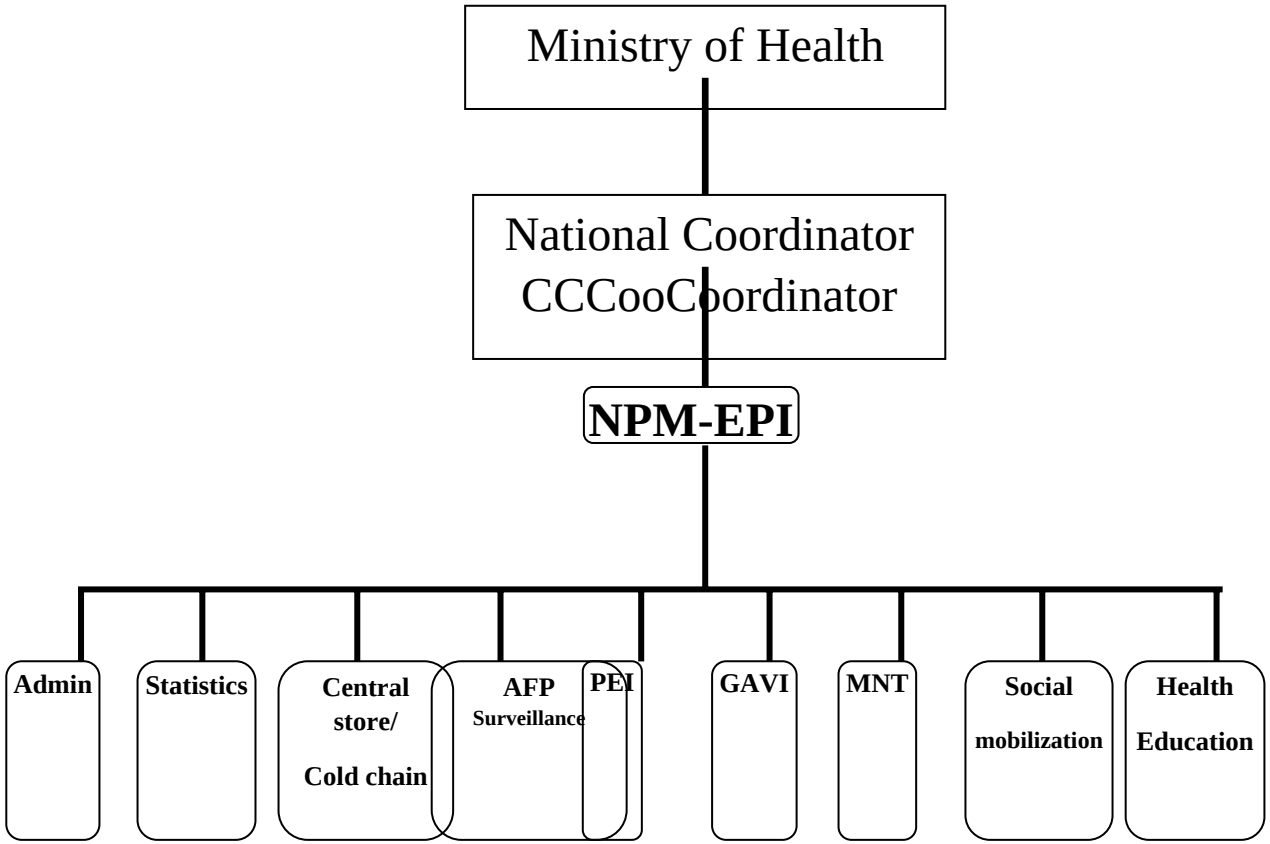
At the national level, there is a good control over the data processing and reporting: immunization reports are properly recorded, processed and stored in a proper archive system. The reporting chain of provinces to the national level appears to be working well. Timeliness of reports received at national level is monitored. Sufficient immunization forms were available at all levels. These strong points are reflected in perfect Quality of the System Index scores for recording (see further).

Areas for improvement

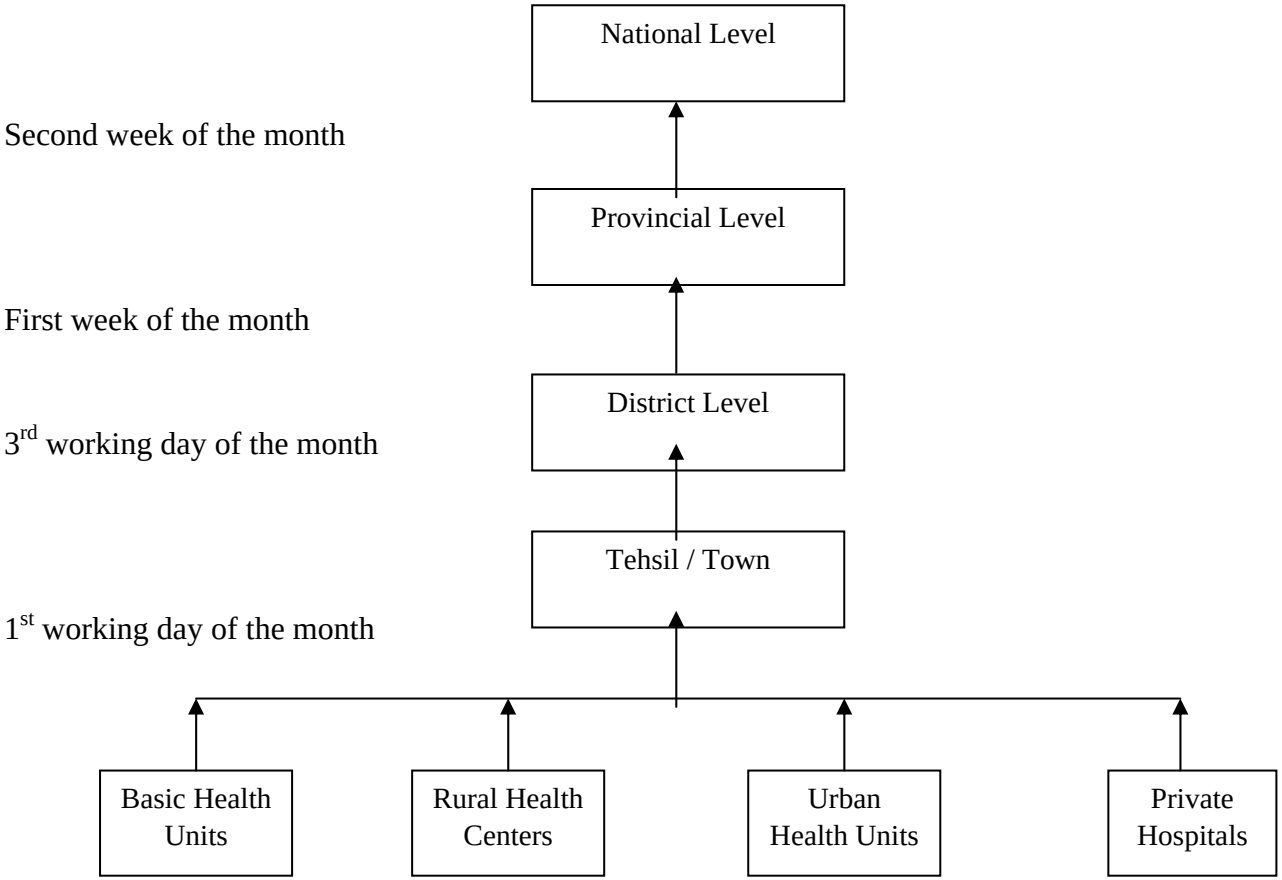
Whereas the collection and processing of the data were good, the data could be used more effectively. Key metrics such as immunization coverage, drop-out rate and vaccine wastage rate were not displayed. Further, reporting for the EPI is not integrated with the Health Management Information System. Finally, sufficient information was not available in the vaccine ledger book for effective monitoring of expiry dates and batch numbers.

Information/data flow and organisation of EPI for the country

Organization of EPI



Reporting (health unit level to national 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 DPT3 < 1 doses recounted from the health unit tally sheets or immunization registers to the numbers that were reported to the higher levels. At the health unit level, tally sheets or immunization registers were widely available and showed a generally good match with what was reported. Overall, a verification factor of **99.1%** was calculated with a 95% confidence interval between 90% and 108%.

This verification factor is significantly higher than the 67% verification factor obtained in the 2001 pilot DQA. We understand that the reasons for this improvement may lie in a better availability of daily registers for recount (where this seemed to be a major problem in 2001), under-reporting by some of the selected HUs (where the 2001 DQA only reports over-reporting), and overall better data consistency at all levels than in 2001.

In nine health units (UC Gujranwala City 31, UC Gujranwala City 4, UC Jamke Chatha, BHU Bebawar, BHU Toormang, BHU Khall, BHU Sawni, Lady Dufferin Hospital and MCH Center Hijrat Colony) DPT3 > 1 was also included in reported figure of DPT3 < 1, which resulted in lower recount. However, there were certain health units as well where DPT3 < 1 was under reported. At two health units, Police Hospital (Karachi district) and RHC Barawal (Upper Dir district), outreach registers for immunization were not available for our verification, which resulted in a lower recount.

Quality of the System Index

QSI at national level:	60%
Recording practices	5.0 / 5.0
Storing and reporting	2.5 / 5.0
Monitoring and evaluation	2.5 / 5.0
Denominator	3.9 / 5.0
System design	2.3 / 5.0

Storing and Reporting (2.50 / 5.0)

Issue observed	There was no written backup procedure for computerized data; further no backup of data was obtained at the national level since May 2003.
Recommendation	A written backup procedure is prepared and implemented. Weekly backup of the data is obtained to help recovering data in case of any disaster.
EPI management comments	Backup procedure for computerized data will be formulated and implemented.

Monitoring and Evaluation (2.50 / 5.0)

Issue observed	1. Up-to-date monitoring chart or table of the current year's immunization coverage and drop-out rate was not displayed at the EPI office. 2. Up-to-date monitoring chart or table of the current year's immunization reporting completeness (from the province) was not displayed at the EPI office. 3. Supervision was not monitored properly, for example, data on the number of districts supervised in 2002 was not available. 4. Vaccine wastage rate was calculated on the basis of formula defined in PC1 instead of the formula defined in the GAVI Manual. Further, data was not available at national level in respect of health unit wastage (including doses damaged). 5. A map showing performance for each district was not displayed at EPI Office. 6. Date of printing/production was not mentioned on each tabulation or chart.
Recommendation	1. A chart or table monitoring the current year's immunization coverage and drop-out rate is prepared and displayed in the relevant office. 2. A chart or table monitoring the current year's immunization reporting completeness is prepared and displayed in the relevant office. 3. Supervision activities are planned and monitored. Data received from districts is thoroughly analyzed and proper feedback is given. 4. Vaccine wastage is calculated based on the formula given in the GAVI manual. 5. A map showing performance per district (coverage, drop-out, population not immunized etc) is prepared and displayed in the relevant office. 6. Date of printing / production is mentioned on each tabulation.

Monitoring and Evaluation (2.50 / 5.0)

EPI management comments	1&2. Due to shortage of space it is not possible for Federal EPI Cell to display all required information. However all information is available both in form of computerized data and hard copies. 3. Federal EPI deals with provincial governments and arranges meetings with provincial EPI managers on a quarterly basis and discusses all EPI issues in these meetings and minutes of the meetings are circulated among all stakeholders for taking necessary measures. Districts are working under the provincial set-up. Provinces have been monitoring and supervising according to their own schedule. 4. Federal EPI Cell used WHO recommended vaccine wastage rate. 5. Due to shortage of space it is not possible for Federal EPI Cell to display all required information. However all information is available both in form of computerized data and hard copies. 6. Agreed and will be implemented in future.

Denominators (3.89 / 5.0)

Issue observed	1. Infant immunization DPT 3 < 1 coverage rates for the audit year were above 100% for Mirpurkhas, Hangu and Bagh districts. 2. For the audit year, the denominator value (for infant immunization) used by the four districts was different from the denominator value information available at the national level.
Recommendation	1. Coverage rate above 100% is investigated and population for each district is updated on a timely basis. 2. The number of infants for immunization should be consistent between national and provincial/district and HU levels. In case of inconsistency, a consensus should be developed on the right number to use.
EPI management comments	1. Coverage rate can be over 100% due to influx of immigrants and refugees in target area. 2. Federal EPI Cell follows 1998 census data and uses 3.3533% for infant target. However, provinces have adopted different % according to their growth rates and surviving infants, therefore, there is possibility in change of denominator.

System design (2.31 / 5.0)

Issue observed	1. Reporting from HU to district level, district to province and from province to national level was not integrated. 2. The reporting form submitted to the national level by province did not allow for calculation of vaccine wastage. 3. There was no written procedure for dealing with reports not submitted within the stipulated time. 4. Provincial monthly reports for the audit year did not use the same form/format. 5. Vaccine ledger book did not contain information in respect of separate batch numbers and expiry dates of vaccines. Consequently, stock could not be monitored in terms of its expiry date. 6. In nine health units, DPT3>1 was also included in reported figures of DPT3<1.
Recommendation	1. In order to make the best use of scarce resources, integrated EPI reporting with the overall Health Management Information System is done. 2. The report from the province should provide the information necessary for calculation of the vaccine wastage (doses used versus administered and discarded). 3. Procedure for dealing with reports not submitted within stipulated time is developed and implemented. 4. A standard reporting format is designed for all provinces, to enhance consistency, completeness and accuracy. 5. Vaccine expiry dates and batch numbers are recorded in the vaccine ledger book for effective control over stock. 6. DPT3>1 is reported separately.

System design (2.31 / 5.0)

EPI management comments	1. EPI has very old and sustainable reporting system since its inception in Pakistan working under the supervision of same EDOs who are also responsible for Health Management and Information System (HMIS) which needs reports on monthly basis not later then 10th of the following month for prompt compliance to MOH and other international agencies i.e. WHO and UNICEF. Moreover, it is responsibility of EDO to include the EPI data into HMI system. 2. Format for district reporting has already been amended and is under printing. 3. Procedure will be formulated for dealing with reports not submitted with in the stipulated time. 4. National format has already been amended and is under printing. 5. Federal EPI store has computerized system having Excel Spread Sheets on vaccines data. All vaccines, AD syringes, safety boxes and other logistics receipt through UNICEF are recorded along with batch/lot numbers, date of arrival, date of expiry. It is possible that batch number and expiry dates for some batches may have been missed. 6. All health units will be requested to report DPT3>1 separately.

Vaccine wastage rates

Vaccine wastage rate for DPT vaccine was 25% as per JRF. Overall vaccine wastage rates could not be calculated because of the lack of information provided by the reporting system. System wastage at central level was reported to be zero.

Reporting Adverse Effects Following Immunization (AEFI)

During the audit year, Adverse Effects Following Immunization were not being reported. However, training activities for the establishment of AEFI surveillance were completed during 2003. The district teams (master trainers – Executive District Officer-Health, District Health Officer Preventive, District Surveillance Officers and District Superintendent Vaccinator) were trained and advised to initiate AEFI surveillance focusing on trigger events. AEFI reporting forms were also distributed to all districts.

Completeness and availability of reports

For all provinces, a complete set of 12 monthly reports was available for both the audit year and the year previous to the audit year covering all the districts. Timeliness of reports is also monitored at national level and 100% of reports were received on time during the audit year.

District – findings and recommendations

District context

Pakistan has one hundred and fifteen districts. Four districts were selected and twenty-four health units from these four districts were selected. In Karachi, there were eighteen towns (DQA “sub-districts”). As explained above, it was therefore decided to select two towns. Within each town, three health units were sampled through the “sub-district” approach. Further, eight towns were deemed non-eligible for this audit due to security reasons.

The coverage rates for DPT3 <1 decreased in all four districts between 2001 and 2002. The average Quality of the System Index score for the four districts was 80%, with a range from 67% to 94%.

District	Coverage 2002	Coverage 2001
Gujranwala	77.40%	78.50%
Sahiwal	73.50%	73.90%
Karachi	71.20%	73.20%
Upper Dir	51.30%	79.10

Data accuracy

Minor variances were observed in tabulations at national and district levels for Sahiwal and Upper Dir, which show under-reporting and are likely to be due to transcription errors (national tabulation for Sahiwal: 51,361, District tabulation at Sahiwal: 51,631).

District	**DPT3 <1 coverage (District tabulation)**	**DPT3 <1 coverage (From HU reports)**
Gujranwala	103,072	108,775
Sahiwal	51,631	52,221
Karachi	197,827	199,652
Upper Dir	Na	15,248

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

Quality of the System Index

Average QSI at province level:	80% (range between 67% and 94%)
Average score recording:	4.6 / 5.0
Average score storing and reporting:	5.0 / 5.0
Average score monitoring and evaluation:	3.5 / 5.0
Average score demographics and planning:	3.6 / 5.0

	Gujranwala	Sahiwal	Karachi	Upper Dir
Recording	5.00	3.89	5.00	4.44
Storing	5.00	5.00	5.00	5.00
Monitoring	5.00	3.89	2.50	2.50
Demographics	3.89	3.89	4.38	2.50

Recording/storing (4.6 / 5.0)

Issue observed	1. Date of receipt was not marked on the HU reports found at district level. 2. Vaccine and syringes stock balance information was not available for monitoring health unit stock-outs. 3. Individual recording form used at six health units was not consistent with the format used at other health units.
No. of districts in which observed	1. Sahiwal and Upper Dir 2. Sahiwal and Upper Dir 3. Sahiwal
Recommendation	1. Date on which report is received is written/stamped by the district office staff making it easier to identify the final report version and for monitoring timeliness. 2. Health unit stock-outs are monitored by the district offices regularly. 3. Standard recording forms are made available at all the HU, as a minimum requirement for high quality reporting.
EPI management comments	A register is maintained to record a log of incoming and outgoing mail. However, mail received by hand is not recorded in the register. Efforts will be made to record in the register, all documents received at district office. No stock-outs occurred during the audit year for vaccines and syringes. However, efforts will be made to monitor stock-outs. Standard individual recording forms are under printing.

Monitoring and Evaluation (3.5 / 5.0)

Issue observed	1. Timing of the health unit immunization reports could not be monitored, since date of receipt of report was not marked on the reports. 2. Up-to-date monitoring chart or table of the current year's drop-out rate was not displayed. 3. There was no routine feedback format for communication from district level to the next lower level. Supervision was not monitored properly, for example, data on the number of health units supervised in 2002 at Karachi and Upper Dir districts was not available. 4. Format for monthly reporting from health unit to upper Dir district did not contain provisions for indicating quantity of stock received, issued, damaged and balance in hand. Consequently, health unit wastages were not monitored at Upper Dir district. 5. No annual report was produced at district level.
No. of districts in which observed	1. Upper Dir 2. Sahiwal and Karachi 3. Karachi and Dir 4. Upper Dir 5. Karachi and Upper Dir

Monitoring and Evaluation (3.5 / 5.0)

Recommendation	1. Timing of HU reporting is monitored and follow up is done on the reports not received. 2. Up-to-date monitoring chart / table of the current year's drop-out rate is displayed at the relevant office. 3. Supervision activities are planned and monitored. Data received from health units are thoroughly analyzed and proper feedback is given. 4. Vaccine wastage is recorded and monitored. 5. An annual report is produced and distributed to those involved in the district health system.
EPI management comments	1. Timing of HU reporting is mentioned in the information flow table. Date of receipt of the report will be endorsed by health unit and district office and efforts will be made to monitor the timing of such reports regularly. 2. Monitoring chart will be prepared and displayed in future. 3. Feedback system is under process, some districts have implemented and some are in still process. Daily and permanent registers were signed by the supervisors whenever, they are visiting the health facilities. 4. Reporting format at districts has already been amended and is under printing. 5. Efforts will be made for capacity building at district level for preparation of annual report.

Denominators (3.6 / 5.0)

Issue observed	1. A static infant denominator had been used since 2001. Further, no targets were set for number of pregnant women to be vaccinated during the year. 2. The proportion of infant immunizations per strategy type was not set up for the district level. 3. District map of catchment area showing immunization strategy was not displayed in district offices.
No. of districts in which observed	1. Upper Dir 2. Sahiwal and Upper Dir 3. Gujranwala and Karachi
Recommendation	1. The denominator number is updated every year based on increasing population. 2. The percentage of infant immunizations is defined for each type of strategy. 3. The district map of the catchment area is displayed prominently in all district offices for public information.
EPI management comments	1. Since Upper Dir district was a new district, therefore, it used same denominator value based on 1998 census. However, district will be requested in future to estimate the target for infant and pregnant women. 2. Planned percentage of infant immunization per strategy will be defined in the micro plans to be prepared for subsequent periods. 3. Map along with chart showing updated data will be displayed in future.

Vaccine wastage rates

No system wastage was reported at district level. Karachi district has no vaccine store at district level. Towns directly receive vaccines from the provincial vaccine store. In Upper Dir district, no wastage could be calculated, as the required information was not available in the reports.

Reporting Adverse Effects Following Immunization (AEFI)

During the audit year, Adverse Effects Following Immunization was not being reported.

Completeness and availability of reports

Seven monthly health unit reports were missing at Upper Dir district. In other districts, all health unit immunization reports were available.

Other issues

In Upper Dir District, the EPI Coordinator post had been vacant for the previous two years. A new EPI Coordinator joined the office only two months earlier and had not been provided training.

Health Units – findings and recommendations

Health Unit context

All twenty-four health units sampled, were visited. They included Basic Health Units (BHUs), Rural Health Centers (RHCs), Mother and Child Healthcare (MCH) centres and private hospitals.

Data accuracy

Tally sheets/child registers were available at all health units, except for the Police Hospital (Karachi) and RHC Barawal (Upper Dir), where outreach registers were not available. An outreach register for RHC Barawal was not available at the time of visit (on September 17, 2003) but after completion of the field visit it was provided at the national office (on September 22, 2003). It was a new register and apparently prepared in fresh ink using the same pen. Further, doses (DPT and TT) were given in a sequence (i.e all DPT1 on one day, all DPT2 on second day, and so on). There were no entries for current year immunizations. Therefore, this register was not considered in the recount.

Except for RHC Kassowal's HU report for May 2002 (Sahiwal district) and Jinnah Foundation's HU report for November 2002 (Karachi district), copies of health unit reports were available at all health units.

Quality of the System Index

Average QSI at health unit level:	80% (range between 70% and 92%)
Average score recording:	3.9 / 5.0
Average score storing and reporting:	4.4 / 5.0
Average score monitoring and evaluation:	4.2 / 5.0

Recording/storing (3.9 / 5.0)

Issue observed	1. Tally sheets for infant immunizations and TT vaccinations were not used for recording; only daily registers were available (13/24 HUs). 2. Stock ledger was not maintained (3/24 HUs). 3. Stock ledgers were not updated for DPT and TT vaccines (10/24 HUs). 4. There were no ledgers for syringes (7/24 HUs). 5. Vaccine batch numbers and expiry dates were not recorded in stock ledgers (5/24 HUs). 6. Child's vaccination history cannot be easily retrieved from the registers (3/24 HUs).
Recommendation	1. Tally sheets are used and archived by HU staff for recording the number of immunization for the period, since this form is the initial source of information for reporting purposes. 2. Stock ledgers are maintained at all health units. 3. Stock ledger is updated immediately upon receipt and issue. 4. Ledgers for syringes are maintained. 5. Vaccine batch number and expiry dates are recorded for effective control over stock. 6. Child's vaccination history is recorded and maintained properly for easy retrieval from the register.
EPI management comments	Tally sheets will be used at all HUs in future. 2,3&4. Stock ledgers for vaccines and syringes will be maintained and updated at all health units. 5. Vaccines batch numbers and expiry dates will be recorded in stock ledgers at all health units, in future. 6. Permanent registers will be maintained at all HUs for retrieval of child's vaccination history.

Reporting (4.4 / 5.0)

Issue observed	1. Previous year's (i.e. prior to 2002) immunization reports and recording form were not available (6/24 HU). 2. Health unit reports were not organised in a file by date in Union Council 79, Sahiwal district.
Recommendation	1. Previous year's records are maintained at all health units. 2. Health unit reports are properly organised in a file by date to facilitate retrieval.
EPI management comments	1. Health units will be advised to maintain previous year's immunization records. 2. Health unit reports will be organized in a file by date.

Monitoring and Evaluation (4.2 / 5.0)

Issue observed	1. There was no mechanism in place to track defaulters or to track vaccine doses that are due (6/24 HU). 2. There was no interaction with the community regarding immunization (6/24 HU). 3. EPI staff at health units were not aware of new births in the target area and did not attempt to follow up to ensure that all children are immunized (4/24 HU). 4. No targets were set for the number of infants at Jinnah Foundation (Karachi) and for pregnant women to be vaccinated during a calendar year or reporting period (4/24 HU). 5. Vaccine wastage was not calculated and monitored (8/24 HU). 6. Health unit map of catchment area showing immunization strategy was not displayed (3/24 HU). 7. Up-to-date chart/table showing the number (or coverage) of child vaccinations by report period for the current year was not displayed (2/24 HU). 8. Drop-out rates were not monitored (4/24 HU).

Monitoring and Evaluation (4.2 / 5.0)

Recommendation	1. HUs should have mechanism / procedure to track defaulters. 2. Health units should interact with community and motivate parents to bring their children for immunization. 3. New childbirth information is updated, and communication with LHWs, private clinics and union councils (for birth registers) is established. 4. Target number of infants and pregnant women is defined by HUs. 5. Vaccine wastage is calculated at least once a year and investigated to identify causes and possible methods to reduce wastage. 6. Map of catchment area is displayed prominently. 7&8. Immunization coverage rates and drop-out rates are calculated at least once a year to evaluate HU performance and future planning.
EPI management Comments	1. Defaulter list will be prepared and used by all health units in future. 2&3. Although it is not part of the responsibility of EPI staff, efforts will be made to interact with the community to create awareness on immunization and obtain information on new births at all HUs. 4. Targets can be set at union council level but not at foundation or private clinic level. 5. Vaccine wastage will be calculated and monitored. 6. Maps were available. Immunization strategy will also be displayed on the maps in future. 7. Up-to-date charts will be prepared and displayed in future. 8. Drop-out rates well be monitored at all health units in future.

Drop-out rates

This measure compares the number of children reported as receiving the DPT1 to those who have received DPT3.

S. No.	Health Unit Name	Drop-out DPT1 to DPT3	Comments
1	UC Gujranwala City 31	-9.60%	
2	UC Gujranwala City 4	0.50%	
3	UC Agran	-2.80%	
4	UC Jamke Chatha	2.50%	
5	Mandiala Warraich	9.30%	
6	UC Kamoke-1	27.20%	
7	Union Council 79	10.80%	
8	Union Council 82	12.50%	
9	Union Council 75	0.80%	
10	Union Council 85	8.0%	
11	Union Council 22	33.20%	
12	RHC Kassowal	37.3%	
13	Kutiyana Memon Hospital	44.90%	
14	Police Hospital	45.60%	
15	MCH Center Hijrat Colony	15.40%	
16	Jinnah Foundation	-3.40%	

S. No.	Health Unit Name	Drop-out DPT1 to DPT3	Comments
17	BHU 48 E	13.60%	
18	Lady Dufferin Hospital	12.80%	
19	BHU Bebawar	31.50%	
20	BHU Khall	19.60%	
21	BHU Toormang	13.60%	
22	RHC Barawal	43.10%	
23	BHU Sharingal	42.30%	
24	BHU Sawni	30.70%	

Vaccine wastage rates

S. No.	Health Unit Name	Wastage Rate DPT	Comments
1	UC Gujranwala City 31	13.20%	
2	UC Gujranwala City 4	-2.50%	
3	UC Agran	11.00%	
4	UC Jamke Chatha	18.50%	
5	Mandiala Warraich	04.40%	
6	UC Kamoke-1	23.20%	
7	Union Council 79	16.10%	
8	Union Council 82	06.20%	
9	Union Council 75	17.20%	
10	Union Council 85	08.70%	
11	Union Council 22	37.00%	
12	RHC Kassowal	28.30%	
13	Kutiyana Memon Hospital	-25.3%	DPT doses were also administered from own purchased vaccine.
14	Police Hospital	46.0%	

S. No.	Health Unit Name	Wastage Rate DPT	Comments
15	MCH Center Hijrat Colony	3.50%	
16	BHU 48 E	1.20%	
17	BHU Khall	28.30%	
18	BHU Toormang	15.00%	
19	RHC Barawal	30.70%	

Wastage rate could not be calculated for five BHUs (Jinnah Foundation, Lady Dufferin Hospital, Bebawar, Sharingal and Sawni).

Reporting Adverse Effects Following Immunization (AEFI)

During the audit year, Adverse Effects Following Immunization was not being reported.

Completeness and availability of reports

Except for the RHC Kassowal HU report of May 2002 (Sahiwal district) and the Jinnah Foundation HU report of November 2002 (Karachi district), copies of health unit reports were available at all health units. The timely submission of monthly immunization reports is not a problem at Gujranwala, Sahiwal and Upper Dir districts, as submission coincides with monthly salary payments.

Coverage/change in DPT3 reported

S. No	Health Unit Name	Reported DPT3 2002	Reported DPT3 2001	Inc / (Dec) in reported DPT3
1	Union Council 82	624	665	(41)
2	Union Council 85	575	509	66
3	Police Hospital	416	671	(255)
4	MCH Center Hijrat Colony	324	272	52
5	BHU 48 E	867	950	(83)
6	Lady Dufferin Hospital	795	709	86
7	BHU Bebawar	1336	1031	305
8	BHU Khall	1307	1267	40
9	BHU Toormang	1259	1291	(32)
10	RHC Barawal	1035	845	190

Other issues

1. As already mentioned in the LATH report following the pilot DQA in Pakistan, stocks were recorded as vials, combining 10- and 20-dose vials under one entry, which may lead to confusion in determining consumption and wastage. When available, the ledgers were not used for management purposes, a point also mentioned in the LATH report.
2. Permanent Registers were often used when Daily Registers were not available.
3. Due to shortages, the staff at the health units often use their own resources to cover stationery and transport requirements, e.g. carbon papers, paper, pens, bus fare etc.
4. No procedures exist for the handing over of registers to new staff members when staff changes take place.

Wrap-up

On completion of the DQA, a debriefing meeting was held on October 11, 2003, to present the preliminary conclusions. The following persons participated in the presentation:

1. Dr. Shafiq ud Din, Chief (Health) Planning & Development (Ministry of Health)
2. Dr. Inam ul Haq, Sr. Health Specialist, World Bank
3. Rachel Lany, WHO Technical Officer
4. Dr. Kobayeshi, JICA
5. Dr. Rehan Abdul Hafiz, National Programme Manager, EPI
6. Dr. Altaf Bosan, GAVI Immunization Advisor
7. Dr. Saleem Ansari, Federal EPI Cell
8. Mr Qadir Bux Abbasi, National Technical Officer, WHO/EPI
9. S. Haider Abbas, PwC Partner
10. Karim Ali Rattansey, PwC Manager
11. Usman Munir, PwC Auditor

All observations were discussed in detail and generally agreed with. Certain exceptions are noted in detail in the EPI management comments herein.

Dr. Inam ul Haq, Sr. Health Specialist, World Bank, suggested that GAVI may consider including visits to provinces (i.e. four reporting levels) in the next DQA.

APPENDIX I. NATIONAL PERFORMANCE INDICATORS

Performance Indicators - 2001 and 2002

Calendar year	Reported DPT3 <1	Change in reported DPT3 <1	DPT3 <1 coverage rate	%Districts DPT3 <1 coverage >= 80%	%dropout DPT1 <1 to DPT3 <1	%Districts < dropout 10%	%DPT vaccine system wastage	Qualty of the System Index Score
2001	3,882,498		75.7%	33.3%	12.0%	31.3%		
2002	3,610,965	-271,533	68.6%	15.8%	16.4%	26.1%	0.0%	60.0%

APPENDIX II. DISTRICT PERFORMANCE INDICATORS

Performance Indicators, Gujranwala- 2001 and 2002						
Calendar year	Reported DPT3 <1	Change in reported DPT3 <1	DPT3 <1 coverage rate	%dropout DPT1<1 to DPT3<1	%DPT vaccine system wastage	Quality of System Index Score
2001	101,641		89.4%	11.4%		
2002	103,072	1,431	88.2%	13.1%	0.0%	93.5%

Performance Indicators, Sahiwal - 2001 and 2002						
Calendar year	Reported DPT3 <1	Change in reported DPT3 <1	DPT3 <1 coverage rate	%dropout DPT1<1 to DPT3<1	%DPT vaccine system wastage	Quality of System Index Score
2001	50,602		84.2%	10.9%		
2002	51,631	1,029	84.2%	15.4%	0.0%	80.0%

Performance Indicators, Karachi - 2001 and 2002

Calendar year	Reported DPT3 <1	Change in reported DPT3 <1	DPT3 <1 coverage rate	%dropout DPT1<1 to DPT3<1	%DPT vaccine system wastage	Quality of System Index Score
2001	302,342		79.1%	6.5%		
2002	197,827	-104,515	48.9%	18.9%	missing	78.3%

Performance Indicators, Upper Dir - 2001 and 2002

Calendar year	Reported DPT3 <1	Change in reported DPT3 <1	DPT3 <1 coverage rate	%dropout DPT1<1 to DPT3<1	%DPT vaccine system wastage	Quality of System Index Score
2001	16,075		90.8%	25.8%		
2002	16,123	48	91.1%	29.7%	0.0%	66.7%

APPENDIX III. HEALTH UNIT PERFORMANCE INDICATORS

Name of the health unit	Reported DPT3<1		Change in reported DPT3<1	% Dropout DPT1<1 to DPT3<1	% DPT vaccine wastage	QSI Score
	2001	2002				
UC Gujranwala City-31	missing	777	missing	-9.6%	13.2%	100.0%
UC Gujranwala City-4	missing	771	missing	0.5%	-2.5%	92.0%
UC Argan	missing	701	missing	-2.8%	11.0%	100.0%
UC Jamke Chatha	missing	589	missing	2.5%	18.5%	77.8%
Mandiala Warraich	missing	487	missing	9.3%	4.4%	88.9%
UC Kamoke -1	missing	415	missing	27.2%	23.2%	96.2%
Union Council 79	missing	837	missing	10.8%	16.1%	81.5%
Union Council 82	665	624	-41	12.5%	6.2%	88.9%
Union Council 75	missing	596	missing	0.8%	17.2%	88.9%
Union Council 85	509	575	66	8.0%	8.7%	88.5%
Union Council 22	missing	393	missing	33.2%	37.0%	57.7%
RHC Kassowal	missing	64	missing	37.3%	28.3%	85.2%

Name of the health unit	Reported DPT3<1		Change in reported DPT3<1	% Dropout DPT1<1 to DPT3<1	% DPT vaccine wastage	QSI Score
	2001	2002				
Kutiyana Memon hospital	missing	390	missing	44.9%	-25.3%	70.4%
Police hospital	671	416	-255	45.6%	46.0%	85.2%
MCH center hijrat colony	272	324	52	15.4%	3.5%	81.5%
Jinnah foundation	missing	121	missing	-3.4%	missing	44.4%
BHU 48 E	950	867	-83	13.6%	1.2%	81.5%
Lady Dufferin Hospital	709	795	86	12.8%	missing	57.7%
BHU Bebawar	1,031	1,336	305	31.5%	missing	96.3%
BHU Khall	1,267	1,307	40	19.6%	28.3%	81.5%
BHU Toormang	1,291	1,259	-32	13.6%	15.0%	96.3%
RHC Barawal	845	1,035	190	43.1%	30.7%	96.3%
BHU Sharingal	missing	668	missing	42.3%	missing	59.3%
BHU Sawni	missing	513	missing	30.7%	missing	48.1%