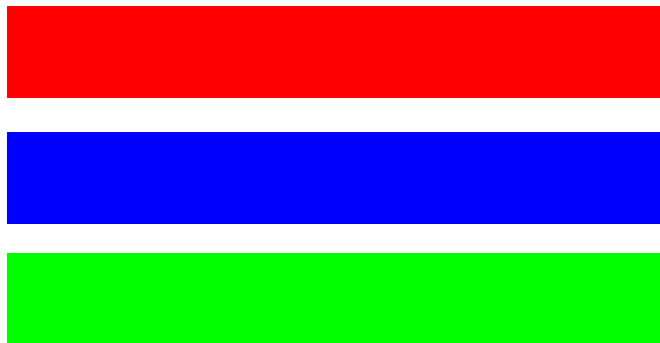


THE REPUBLIC OF THE GAMBIA
EXPENDED PROGRAM ON IMMUNIZATION
DEPARTMENT OF STATE FOR HEALTH AND SOCIAL WELFARE



VACCINE WASTAGE ASSESSMENT IN THE GAMBIA

Vaccine Independent Initiative Project for Africa (FED/ARIVA)

May 21st – June 01st 2004

Preliminary Report

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- All ARIVA staff.
- All who participated in the successful completion of the study.

LIST OF ACRONYMS

AD Syringes: Auto-Disable Syringes

ARIVA: Appui Régional à l'Indépendance Vaccinale en Afrique

BCG : Bacille Calmette et Guérin

CATR: Cellule d'Appui Technique Régionale

CHN: Community Health Nurse

95% CI: 95% Confidence interval

CREDES: Centre de Recherches Et d'Études Pour le Développement de la Santé

CRD: Central River Division

DHS: Direction of Health Services

DHT-W: Division Health Team-West

DOHSW: Department Of Health And Social Welfare

DPT: Diphtheria-Pertuissis-Tetanus

EPI: Expanded Program On Immunization

FED: Fonds européen de Développement

HD: Health Division

HEP.B: Hepatitis B

HIB: Haemophilus Influenza B

HIV:/AIDS Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome

HS: Health Structure

IDSR: Integrated Disease Surveillance and Response

LRD: Lower River Division

NBED: North Bank East Division

NBWD: North Bank West Division

OPV: Oral Polio Vaccine

PHC: Primary Health Care

PHF: Public Health Facility

URD: Upper River Division

SOS: Secretary of State

TBA: Traditional Birth Attendant

TT: Tetanus

VHW: Village Health Worker

WBD: Western Bank Division

WHO: World Health Organization

Y/Fever: Yellow Fever

Summary

Context and Justification

European Union under the ARIVA Project encompasses a strong commitment to contribute to interventions that reinforce the fight against communicable diseases. As a result ARIVA scope aims to contribute to a sustainable improvement of high immunization coverage for diseases targeted by the Expanded Program On Immunization.

In addition the ARIVA Project has a major concern with contributing and facilitating vaccine supply and demand in the Public Health Facilities as well as boosting immunization routine in these structures.

In this scope, demand in routine immunization increased thanks to sustainable actions from EPI social mobilization.

Furthermore EPI reviews attested that vaccine utilization and wastage resulted from too many current practices. For example, it can result from an uncrowdy child during immunization sitting consecutive from the parent's misunderstanding about immunization benefits.

Lack of directives, obvious guidelines for opened vial policy, assessment vaccine requirements from target-based population estimate including vaccine wastage rate without considering vaccine coverage objectives are the many leading causes of wastage in immunization.

In order to enlighten these issues of concerns about vaccine utilization and wastage, studies related to these matters have been conducted in many countries supported by the ARIVA Project but the follow up of recommendations from these studies still remains unknown.

So the assessment of the implementation of the results of these studies in vaccine utilization and wastage is a strong necessity today in The Gambia.

Objectives

- To identify the follow up of recommendations the study conducted in Vaccine Utilization And Wastage conducted in The Gambia in 1999 under ARIVA Project.*
- To check the validation and the appropriation of the study by the National Health authorities.*
- To identify actions undertaken by the authorities to ensure the follow up of the study. (E.g. plan of action for wastage).*
- To asses the impact of the plan of action on EPI activities in the country.*
- To suggest improvement that provides additional impetus in the ongoing plan of action.*

Material and Methods:

This cross-sectional study used a questionnaire to assess Vaccine Utilization and Wastage developed by the EPI health team in Banjul under ARIVA Consultant. Three questionnaires were applied to cover the three levels of the health system.

The sampling method uses three sample frames, one at the Central level, one at the Divisional level, and one at the Public Health Facility level. At the Central level, the EPI Division staff completed the survey. At the Divisional level, a complete census was performed including all of the six Health Divisions in the country. At the peripheral level, a random sample was performed using Public Health Facilities as sample units. From 48 Public Health Facilities listed, we randomly drew 18 that represent 37.8 percent of all the Public Health Facilities. Finally our sample was composed of: one structure at the Central level, the six Health Divisions and 18 Public Health Facilities at the local level. In all, 25 structures were involved in the study.

Three specific questionnaires were built during a workshop with the EPI teams and the coordinator/investigator. Six teams were trained for data collection at the Divisional level where the questionnaire was tested. The data collection lasted five days from May 24th 2004 to May 28th 2004.

Six interviewers, six supervisors and six drivers completed the survey under the coordinator's supervision. Data was entered using EPI info 6.04. The study cost was paid by CREDES through out the CATR/ARIVA Project in Burkina Faso.

Results:

The EPI service, the six Health Divisions and 18 Public Health Facilities were visited. They represent 37.8 percent of the health structures in the country.

66.7 percent of the Health Divisions disposed of proper vaccine ledgers and used them to monitor vaccine supplies.

At the Public Health Facilities, ledgers helped to compute wastage rate from January to March 2004. We compared the findings with the previous study during the period January '98 to June '98. BCG and Yellow Fever still have the highest wastage rates. Hib and HEP.B have the lowest wastage rates.

72 percent of Public Health Facilities reused opened vials of DPT vaccine and 28 percent of them did not.

All staff in the Health Divisions was trained in vaccine management except newly posted staff in the Public health Facilities.

Two Health Divisions did not have cold chain storage for vaccine. Consequently this strongly affects the refrigeration condition process as well as the distribution and transportation of vaccine at the local level.

75 percent of Health Divisions and more than 50 percent of Public Health Facilities experienced shortage in vaccine supply especially for Oral Polio Vaccine.

Acquisition, stocking and allotment of supplies from Central level, Health Divisions and Public Health Facilities levels can be delayed at any time because of lack of logistic in the implementation process.

Although the condition storage of vaccine was acceptable according to WHO requirements, BCG and Yellow Fever antigens still had the higher wastage rate in immunization routine.

Supervision activities towards Public Health Facilities were not regular and the newly posted staffs were not aware of new policy in wastage and vaccine utilization.

Conclusions:

Although the result of the study in Vaccine Utilization and wastage conducted in 1999 in The Gambia were well applied and practiced by health workers and a plan of action for wastage and Injection Safety validated by the Authorities as well as improvement made in wastage rate for some antigens, there is a strong need to boost vaccine management in the health structures and provide impetus for the plan of action.

We suggest: 1°) to supply cold chain store to the two Health Divisions (North Bank West Division, Lower River Division), 2°) to review vial size of vaccine and consequently to augment the capacity of cold chain stores. 3°) to develop a sensitizing plan of action for DPT booster program, 4°) to improve vaccine supplies in Heath Divisions and facilitate storage and movement in Public Health Facilities, 5°) to review supervision plan mechanism to overlap all Public Health Facilities, 6°) to promote operational research for BCG and Yellow fever antigens which still have higher rate of wastage in spite of the respect of policy in wastage.

I INTRODUCTION

1.1 Generalities

Located on the Western Coast of Africa, The Gambia extends inland from the Atlantic for about 320 km along the banks of the River Gambia, with widths varying from 24 to 48 km, covering an estimated area of 11,000 sq.km located in the Sahel region, it is surrounded on three sides (east, south, and north), by The Republic of Senegal and on the west by the Atlantic Ocean. The country is also divided into 2 equal halves, namely the North and South banks, by the River Gambia, which runs from the Futa Jallon highlands in the Republic of Guinea to the Atlantic Ocean. It lies between latitudes 13 and 14 degrees North. The Gambia has a short rainy season, lasting from June to October, during which time rainfall ranges from 850 to 1,200 mm. Over the last twenty years, The Gambia has been hit by a rapid rate of desertification and deforestation, partly due to excessive land use, the destruction of vegetation, erosion of beaches and increase in human livestock population.

A Secretary of State (SOS) heads the health service for Health and Social Welfare assisted by a Permanent Secretary, two Deputy Permanent Secretaries and the Director of Health Services (DHS).

The health care system of The Gambia follows the primary health care strategy and is organized into three levels –primary, secondary, and tertiary. The primary levels provide for initial care and preventive action through a network of village health posts, linked through key villages and staffed by Villages Health Workers (VHWs) and Traditional Birth Attendants (TBAs) supervised by Community Health Nurses (CHNs). This level is the first point of contact for people seeking health care. At this stage 492 health posts are available including 16 dispensaries and 145 outreach stations. The secondary level, which provides for procedures less complicated than the tertiary, has a network of major and minor health centers, and dispensaries with more specialized staff and equipment. It provides for routine preventive and curative services and some medical, surgical interventions. This intermediate level is composed of 36 health centers. The tertiary level, with 4 Government referral hospitals, provides for more specialized services and interventions and is intended to function as a referral service for the secondary level. In addition there are 7 NGO hospitals and 13 private clinics.

It is estimated that about 80 percent of the population live within 7 km of a Health Facility and 80 percent of the villages have a primary health care program.

The Gambia is divided into 7 administrative divisions comprising five rural and two urban administrative areas (Kanifing and Banjul).

To achieve decentralization, the country is divided into 6 Health Divisions administrated by Divisional Health Teams (DHTs): Western Health Division, Lower River Health Division, North Bank East Health Division, North Bank West Health Division, Central River Health Division, and Upper River Health Division. Divisions are subdivided into primary health care (PHC) villages and key villages. There are 490 Primary Health Care villages and 69 key villages.

According to the latest census of demographic statistics, The Gambia population is up to 1,4 million inhabitants. By year 2005, it will reach 1,7 million, with an annual growth rate of 4.2 percent. Almost 60 percent of the population lives in rural areas with women representing 51 percent of the crude population. The density of the population is approximately 124 persons

per square kilometer, the highest population density in the world. At the present trend, this population is expected to double in the next 16 to 17 years. This is a result of high fertility rate of 6.04 births per women and a low infant mortality rate at about 84 per 1,000 live births. (The average in the Sub Saharan countries is 91 per 1,000 live births).

The age distribution of the population shows a predominance of youths. Nearly 45 percent of the population is below 15 years of age and 19 percent between the ages of 15-24, according to the 1993 census.

The average life expectancy at birth is about 53 years, with 52 for the male and 55 for the female.

The crude birth rate is 46 per 1,000. The Gambia has a crude mortality rate of 19 per 1,000 in 1993 census.

The Infant Mortality Rate and Under-Five Mortality Rate declined from 217 and 290 per 1,000 respectively in 1973 to 167 and 260 per 1,000 live births in 1998. Infant's survival is highest in Banjul and Kanifing areas and lowest in the eastern part of the country.

The leading causes of death are Malaria, Acute Respiratory Infection, Diarrhea and Malnutrition.

The maternal mortality rate is estimated at 7.3 per 1,000 live births.

The Literacy rate of the population aged 10 and above has increased from 26 percent in 1985 to 37 percent in 1998. Males are more educated than females. Statistics shows that 54 percent of the male population aged 10 and above are educated as opposed to 26 percent of the female population.

The level of education is also low. Boys spend less than 6 years in school and girls spend about 4 years in the education system.

Public educational expenditures are growing at an average rate of 9 percent. Basic education received 56 percent of education expenditure and secondary education received 10 percent. Development expenditure on education averaged 31 percent of the total budget between 1990 and 1996.

In 2002, personnel health care expenditures accounted for 25 percent of the total amount of health expenditure. The best increase was in 2001 with 28 percent.

Public programs contributed 13.6 percent of the funding for health care.

Government plays a major role in planning, directing, and financing health services in The Gambia.

1.2 Justifications

European Union under the ARIVA Project encompasses a strong commitment to contribute to interventions that reinforce the fight against communicable diseases. As a result the ARIVA scope aims to contribute to a sustainable improvement of high immunization coverage for disease targeted by the Expanded Program On Immunization.

In addition the ARIVA Project has a major concern with contributing and facilitating particularly vaccine supply and demand in the Public Health Facilities as well as boosting immunization routine in these structures.

In this scope, demand in routine immunization increased thanks to sustainable actions from EPI social mobilization.

Furthermore EPI reviews attested that vaccine utilization and wastage resulted from to many current practices. This circumstance is attributable to uncrowdy children during immunization sitting consecutive from the parent's misunderstanding about immunization benefits.

Lack of directives, obvious guidelines for opened vial policy, assessment vaccine requirement from target-based population estimate including vaccine wastage rate without considering vaccine coverage objectives are too many leading causes of wastage in immunization.

In order to enlighten these issues of concerns about vaccine utilization and wastage, studies related to these matters have been conducted in many countries supported by the ARIVA Project but the follow up of recommendations from these studies still remains unknown.

So the assessment of the implementation of the results of these studies in vaccine utilization and wastage is a strong necessity today in The Gambia.

II OBJECTIVES

2.1 Overall Objectives:

Based on recommendations from the study conducted in The Gambia about Vaccine Utilization and Wastage, we now need to assess the effect of these recommendations in routine immunization.

2.2 Specific objectives

- To identify the follow up of recommendations the study conducted in Vaccine Utilization And Wastage conducted in The Gambia in 1999 under ARIVA Project.
- To check the validation and the appropriation of the study by the National Health Authorities.
- To identify actions undertaken by the authorities to ensure the follow up of the study. (E.g. plan of action plan for wastage).
- To assess the impact of the plan of action on EPI activities in the country.
- To suggest improvement that provides additional impetus in the ongoing plan of action.

III MATERIAL AND METHODS

3.1 Sampling Methodology And Sample Frame Study

The sample included the six Health Divisions that constitute the area of the study.

At the Central level, only EPI services were targeted for the study because of the special purpose of the survey. At the Divisional level all the six Health Divisions were involved in the survey. At the Health Facility level, a random sample was performed using an exhaustive list of all Health Facilities

3.2 Sample Size

At the Central level, only EPI Service was involved in the study.

At the Divisional level, we did a complete census including all of the six Health Divisions in the country.

At the Public Health Division level, we generated a comprehensive list of all Public Health Facilities, forty-eight (48) in total and randomly selected eighteen (18) of them. This random selection represented 37.8 percent of all the Public Health Facilities.

Our sample size was finally composed of:

- The EPI service at the Central level.
- The six (6) Health Divisions
- Eighteen (18) Public Health Facilities.

Finally the study was concerned with 25 health structures around the country.

3.3 Study Design

We conducted a cross-sectional study, from May 21st to June 1st 2004, at the Central, Health Divisional and Public Health Facility levels, using a specific questionnaire at each level.

Questionnaires were drawn from the specific recommendations of the “National Survey In Vaccine Utilization and Wastage Research” conducted from May 24th n to June 30th 1999 in The Gambia.

At each level, the global questionnaire was composed of three parts:

- Policy and strategic plan for wastage and vaccine management.
- Equipment and material/wastage.
- Training and supervision in vaccine utilization.

3.4 Research Method Description

The team of interviewers performed discussions with EPI storekeepers about the delivery, storage and distribution of vaccine supplies from the manufactures to Public Health Facilities.

They also asked about policy and strategic action for vaccine management and wastage

They reviewed vaccine inventory records, registers, and ledgers for vaccine and material supplies.

The teams also visited fields in the Health Divisions and Health Facilities where the study was carried out.

At the Central and the Health Division levels, interviewer teams checked vaccine storage, supply and demand, vaccine and refrigeration conditions, took note about storage temperature. In addition they asked questions about Ledgers, EPI return forms, plan of action for wastage and its implementation, training and supervision.

At the Public Health Facilities, questions were asked about vaccine management, records, and adherence to Opened Vial Policy for DPT vaccine, demand and supply of vaccine, training and supervision.

Data was collected in these health structures from May 24th to May 28th 2004 using a specific questionnaire per level.

A team from the EPI service at the national level and a team from the Health Division level conducted the interview.

3.5 Criteria Of Inclusion Or Exclusion

All the Public Health Facilities were eligible for the study as well as hospitals and private clinics within the Health Divisions. At the National level, we excluded all services that did not deal with immunization activities.

Six teams were composed to conduct the study with three drivers around the fieldwork. In other words, each team had four Health Facilities to visit with a driver. In total eighteen (18) Public Health Facilities were visited, six (6) Health Divisions interviewed and the EPI service inspected.

A consultant from FED/ARIVA coordinated the study.

3.6 Supervision

Six supervisors from the Central level (EPI services) were in the field to supervise the survey.

3.7 Data Analysis.

Data was entered and analyzed using Epi-Info Software (Version 6.04b) and Excel. We computed frequencies cumulative frequencies, means, and standard deviations for all observations using as denominator the total of structures involved according the level where the survey was conducted.

IV RESULTS

4.1 Using Forms In EPI Management

66.7 percent of the Health Divisions disposed of proper vaccine ledgers and used them to monitor vaccine supplies, e.g. to schedule the next time to request vaccine or to look at the expiration date, to inventory the quantity of vaccine received and the quantity of vaccine disbursed to Health Facilities. Two Health Divisions did not have ledgers to monitor vaccine supplies because refrigeration arrangements or cold chain storage were not available in these Health Divisions. Bookkeeping for vaccine was available in all Public Health Facilities.

Supplies EPI return forms that include vaccine usage and wastage forms were available in all Health Divisions and all Public Health Facilities.

All Public Health Facilities had EPI monthly return forms that include vaccine usage and wastage. Teams were asked to collect, note and record all the details from these forms in order to compute wastage rate for vaccine from January to March 2004. The computation results were compared with the findings of 1999's survey in Vaccine Utilization and wastage Research in The Gambia, using the extracted reports of wastage rate from January to June 1998.

We particularly focused this wastage rate study at the operational level, even though we found interesting details in this matter at the Central level and at the Divisional level. (Table 1, Table 2 and Table 3, Appendix 1).

4.2 DPT Opened Vial Policy

72 percent of Public Health Facilities reused opened vials of DPT vaccine and 28 percent of them did not for many reasons. The main reasons were DPT Vaccine was dried and frozen and opened DPT vaccine should not be reused after six hours at the room temperature. These issues were discussed up with the new staff in the Public Health Facilities. (Table 4, Appendix 1).

4.3 Training Activities In Return Forms

All Health Divisions proceeded training in proper record keeping on vaccination return forms. Six Public Health Facilities had not have been trained in proper record keeping on vaccination return forms because they were newly appointed to these health structures. As a result these newly posted staff were not selected for training purposes. (Table 5, Appendix 1).

4.4. Demand And Supply Of Vaccine

Frequency of requesting vaccine was done every quarter in all the Health Divisions that stored vaccine. Two health Divisions did not request vaccine (No equipment, no materials or supplies exist in these health structures).

Public Health Facilities roughly requested vaccine each month on a regular basis.

Frequency of supplying vaccine was carried out every quarter in all Health Divisions, which stored vaccine. Again two Health Divisions with no cold storage did not request vaccines. Public Health Facilities receive vaccine supplies each month on a regular basis. (Tables 6 and Table 7, Appendix 1).

4.5 Shortage Of Vaccine

75 percent of Health Divisions and more than 50 percent of Public Health Facilities had shortage experience in vaccine supply.

(Table 8, Table 9, and Table 10, Appendix 1)

75 percent of Health Divisions did not have Oral Polio Vaccine in their cold storage room whereas other antigens were available.

Although OPV wastage rate was reduced from 19.3 percent (1998) to 16.85 percent (2004), i.e. a decrease of 13 percent, health structures are still facing a shortage with this antigen in The Gambia.

In addition, more than 50 percent of Public Health Facilities had a shortage of OPV.

4.6 Temperature Monitoring

Temperatures measures were noted for all antigens at the Central Level, at all Health Divisions and Public Health Facilities having cold storage and then the vaccine temperature was verified using the recording charts for all refrigerators as each had its own refrigerator. The results are shown in table 11.

4.7 Supervision Activities

Supervision was conducted as a regular activity in Health Divisions. Each month more than 83.3 percent of the Health Divisions performed monitoring activities in vaccine utilization and wastage towards Public Health Facilities.

Nevertheless, 40 percent of the Public Health Facilities were not regularly visited. (Table 12, Appendix 1).

V DISCUSSIONS

Recommendations about vaccine utilization are well applied in the Health Division since the last survey of June 1999 on vaccine utilization and wastage.

For example, vaccine utilization recording in the Health Facilities rose from 50 percent in 1999 to 94.4 percent in 2004. Consequently, the use of completed records of vaccine accounted for a 90 percent increase in the health structures, compared with the previous study.

In 1999, most of the Health Divisions as well as Public Health Facilities were not able to keep records on vaccine utilization and wastage. Today EPI return forms are readily available in most of the health structures. So the system for vaccine utilization and wastage form was widespread in every health structure in The Gambia.

For example, in 1999, there were supplies return forms in less than 50 percent of the Health Facilities compared with 95 percent of the availability of forms for the present year.

Taking only into account data from the return forms at the operational level, i.e. Public Health Facilities, we computed all wastage rates for antigens from January to March 2004.

Comparing these results with the former study in 1999, from January to June 1998, we can say that wastage rate for vaccines has substantially improved for all antigens, except DPT, Measles, Yellow Fever and Tetanus.

For example, Hib wastage rate dropped 60 percent from 1998 (13.5 percent) to 2004 (5.4 percent). This was the best drop in vaccine wastage.

However, DPT wastage rate rose 44 percent from 1998 (24.5 percent) to 2004 (35.32 percent). For Measles, Yellow Fever and Tetanus, the difference was not statistically significant between the former and the actual study.

We noticed that BCG and Yellow Fever still had the highest wastage rates. Hib and HEP.B have the lowest wastage rates when we computed waste rate from January to March 2004. These findings are similar to the reports extracted from the 1999 's survey about antigen wastage rates from January to June 1998. The table below shows the results of wastage rates from the two studies. (The first semester of 1998 and the first quarter of the present year).

Public Health Facilities: Wastage Rate During The First Quarter In 2004 Compared with The First Semester In 1998. (*)

ANTIGENS	Wastage Rate In The First Semester 1998	Wastage Rate In The First Quarter 2004	P value
DPT	24.5	35.32	0.000001
HIB	13.5	5.4	0.000001
OPV	19.3	16.85	0.004
BCG	56.5	44.08	0.000001
HEP.B	13.4	10.14	0.0034
Measles	32.96	37.98	0.00267
Y/Fever	48.4	49.86	0.179
TT	20.25	22.26	0.156

NB (*) we computed wastage rate using data from the survey in 1999 for all Public Health Facilities included in the study from Jan.' 98 to June '98 (Appendix 1: Table 4 shows the details of computation for Public Health Facilities, extracted from the 1999's survey on vaccine Utilization and Wastage), and we compared the results from meta-analysis with the present survey using a retrospective data from return forms at the health Facility level from January to March 2004.

Furthermore we learned from health workers that logistics were not sufficient to allocate vaccine supplies in Public Health Facilities. As a result low movement of vaccine could explain shortage and delay in storage condition process. Indeed delay in supply and demand was identified in the Health Divisions because of limited resources. Consequently these issues could affect vaccine management and wastage and need to be improved in term of logistics and equipment.

However, we observed a strong matching between request and supply of vaccine on a regular basis in all Health Divisions that can store antigens.

Moreover, acquisition, stocking and allotment of supplies from Central level, Health Divisions and Public Health Facility levels can be delayed at any time. At the time of the study, we observed a one week delay for Oral Polio Vaccine from the Central level to the Health Division because of lack of logistics in the implementation process.

This consequence stems from the Health Divisions, which were supposed to supply Public Health Facilities. It is due to acquisition or stocking problems rather than utilization or vaccine wastage because wastage rates for OPV were roughly improved compared with the 1999 survey.

Nevertheless, important progresses had been made in vaccine storage conditions if we consider that as stated by WHO, vaccine must be kept cool and transported at +2°C to +8°C.

However the EPI cold chain must have colder storage conditions for OPV vaccine (-15°C to -25°C). These conditions were not met for OPV at any health structure. A lack of good storage condition for this antigen may explain shortage of OPV vaccine at any Health Facility or Health Division. Shortage of OPV at any Health Facility or Health Division may be explained by a lack of good storage conditions for this antigen. For example, temperature drastically dropped from -19.6 °C to -1.15°C between January to March 2004 in EPI cold chain. The same phenomenon was also observed in the Health Divisions.

Achievements in supervision activities might explain the decrease of wastage rate among antigens in the Public Health Divisions.

Even though supervision activities were performed and conducted on a regular basis, they were not extended to all the Public Health Facilities.

As many cross-sectional studies of this type, the survey may include some bias that can be linked to the questionnaire, the interpretation of the interviewer or other cultural considerations that were not corrected on time.

VI RECOMMANDATIONS

For the Government

- To suggest to the Government to provide impetus for a plan of action for wastage.
- To supply cold chain storage to the two Health Divisions (North Bank West Division, Lower River Division).
- To review vial size of vaccine and consequently increase the capacity of cold chain storage.
- To outfit Health Divisions with cold chains as required facilitating storage and transportation of vaccine supplies.
- To expand EPI storage facilities and standby generators available all over the Health Divisions.
- To optimize OPV refrigeration by improving storage capacity of EPI cold chain and Health Division (Acquisition of new material and equipment)

For the EPI

- To develop a sensitizing plan of action for DPT booster program.
- To sensitize Public Healthy Facilities new staff in vaccine utilization policy.
- To improve open Vial Policy for DPT Vaccine at the Health Facility level.

- To train newly posted or assigned staff in Public Health Facilities in EPI returns forms.
- To facilitate circulation of vaccine supplies and allocate more antigens in the Health Divisions.
- To improve vaccine supplies in Health Divisions and facilitate storage and movement in Public Health Facilities.
- To review supervision plan mechanism to overlap all Public Health Facilities.

For the partners

- To contribute to building an action plan for wastage and participating to its implementation.
- To promote operational research for BCG and Yellow Fever antigens which have higher rate of wastage in spite of the respect for wastage policy.

VII CONCLUSION

Many issues of concerns are raised among vaccine utilization and wastage management. We know that immunization routine has been improved with a high coverage rate in the target population.

In 1999, a study was conducted in The Gambia to find out the leading causes of wastage in vaccine utilization. Some recommendations were made to enhance the implementation of these results for sustainable actions in wastage policy.

In the scope of this present study we expected to assess performances in wastage and vaccine utilization among health services.

We found that policies about vaccine utilization was widely set and brought into practice in the public health structures. EPI forms and registers were available and highly employed in order to preserve information about vaccine management. Opened vial DPT Vaccine recommendation was applied on a regular basis.

Wastage antigen rates were particularly improved. However BCG and Yellow Fever Vaccines still have higher wastage rates. Further operational studies might be recommended to see why in practice these antigens have the highest wastage among all other antigens at any Public Health Facilities regardless of vaccine storage conditions.

Using small vial sizes in poor cold room storage conditions need to be reviewed in term of vaccine arrangement and capacity of cold the chain.

Movement in the personnel and staff change was common in many health structures particularly at the Health Facility level. As a result newly posted staff were often not trained in vaccine utilization and wastage policy.

Supply and demand of vaccine was performed on a regular basis every quarter in Health Divisions and roughly every month in Public Health Facilities but there were many problems with the logistics, transportation, stocking and circulation of the vaccine. Consequently

shortage was very common in the supply process due to lack of equipment and materials in the Health Divisions.

Even though OPV wastage rate was particularly reduced with better storage conditions, its availability was strongly affected in health structures. Consequently storage and refrigeration conditions should still be a big concern, especially for OPV. Cold room capacity need to be extended and widely spread in all Health Divisions.

Regular supervision activities based on guidelines might forecast these issues of concern in vaccine storage and wastage.

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VIII LIST OF APPENDIX

Appendix 1: Tables

Table 1: Bookkeeping For Vaccine Utilization In Health Services

HEALTH STRUCTURES	Number of HD	%	95% CI
Health Divisions having and using proper vaccine ledgers	4	66.7	22.3-95.7
Health Divisions not having proper vaccine	2	33.3	4.3-77.7
TOTAL	6	100	
	Number of PHF		
Public Health Facilities having and using proper vaccine	17	94.4	72.7-99.9
Public Health Facilities not having and using proper vaccine	1	5.6	0.1-27.3
TOTAL	18	100	

Table 2: EPI Return Forms For Vaccine Utilization In Health Services

HEALTH STRUCTURES	Number of HD	%
Health Divisions having EPI return forms	6	100
Health Divisions not having EPI return forms	0	
TOTAL	6	100
	Number of PHF	
Public Health Facilities having EPI return forms	18	100
Public Health Facilities not having EPI return forms	0	
TOTAL	18	100

Table 3 Details Of Vaccine Management Forms From Health Public Health Facilities During The First Quarter Of Year 2004

	DPT	HIB	OPV	BCG	HEP.B	Measles	Y/ Fever	TT
Total received	5,471	14,531	20,211	10,753	15,564	15,019	9,787	7,935
Immunized	1,333	10,360	11,427	3,370	9,938	2,330	2,463	3,184
Balance	3,410	3,581	6,467	4,726	4,504	11,262	4,874	3,839
Wastage rate	35.3227	5.3881	16.8583	44.085	10.1447	37.9824	49.8677	22.2656
Wastage in doses	728	590	2,317	2,657	1,122	1,427	2,450	912
Total used	2,061	10,950	13,744	6,027	11,060	3,757	4,913	4,096

Table: 4 Details Of Computation Meta-analysis From Health Public Health Facilities During The First Semester Of Year 1998 Of (Extracted from The Survey Conducted From May to June 1999 In Vaccine Utilization And Wastage Research In The Gambia)

	DPT	HIB	OPV	BCG	HEP.B	Measles	Y/ Fever	TT
Total received	76,710	58,150	16,1086	63,460	44,960	40,740	44,932	52,470
Immunized	39,850	37,160	88,823	18,162	28,433	13,937	14,118	26,908
Balance	23,937	15,190	51,014	21,711	12,130	19,950	17,571	18,730
Wastage rate	24.4879	13,501	19.3046	56.497	13.3932	32.963	48.401	20.249
Wastage in doses	12,923	5,800	21,249	23,587	4,397	6,853	13,243	6,832
Total used	52,773	42,960	110,072	41,749	32,830	20,790	27,361	33,740

Tables 5: Public Health Facilities Reusing Opened Vials Of DPT Vaccine

	Number of PHF	%	95% CI
PHF reusing opened vial of DPT vaccine	13	72.2	46.5-90.3
PHF not reusing opened vial of DPT vaccine	5	27.8	9.7-53.5
TOTAL	18	100	

Table 6: Training Activities In Vaccine Usage And Return Forms

HEALTH STRUCTURES	Number of HD	%	95% CI
Health Divisions having training in EPI return forms	6	100	
Health Divisions not having training in EPI return forms	0		
TOTAL	6	100	
	Number of PHF	%	95% CI
Public Health Facilities having training in EPI return forms	12	66.7	41.0-86.7
Public Health Facilities not having training in EPI return forms	6	33.3	13.3-59.0
TOTAL	18	100	

Tableau 7: Vaccine Order Frequency In Health Structures

Request Vaccine Activities	Number of HD	%	95% CI
Once a year	0	0	
Twice a year	0	0	
Three times a year	0	0	
Over four times a year	4	66.7	22.3-95.7
Not applicable	2	33.3	4.3-77.7
TOTAL	6	100	
	Number of PHF		
As required	0		
Once a month	15	83.3	61.7-98
Twice a month	0		
Weekly	0	100	
When the Stock is low	3	16.7	3.6-41.4
TOTAL	18	100	

Tableau 8: Vaccine Supply Frequency In Health Structures

Vaccine Supply Frequency	Number of HD	%	95% CI
Once a year	0	0	
Twice a year	0	0	
Three times a year	0	0	
Over four time a year	4	66.7	22.3-95.7
Not applicable	2	33.3	4.3-77.7
TOTAL	6	100	
	Number of PHF		
As required	0		
Once a month	18	100	
Twice a month	0		
Weekly	0		
When the stock is low	0		
TOTAL	18	100	

Tables 9: Health Structures Experienced Shortage Of Vaccine

HEALTH STRUCTURES	Number of HD	%	95% CI
Health Divisions having shortage of vaccine	3	75	19.4-99.4
Health Divisions not having shortage of vaccine	1	25	0.6-80.6
TOTAL	4	100	
	Number of PHF		
Public Health Facilities having shortage of vaccine	10	55.6	30.8-78.5
Public Health Facilities not having shortage of vaccine	8	44,4	21.5-69.2
TOTAL	18	100	

Tables 10: Antigens Facing Shortage In The Health Divisions During The First Quarter Of Year 2004.

Materials	Number of Health Divisions	Total of Health Divisions	Percentage
BCG	0	4	0
OPV	3	4	75
HEP.B	0	4	0
DPT/HIB	0	4	0
Measles	0	4	0
Y/Fever	0	4	0
TT	0	4	0
DPT B	0	4	0

Tables 11: Antigens Facing Shortage In The Public Health Facilities During The First Quarter of Year 2004

Antigens	Number of Health Facilities	Total of Health Facilities	Percentage
BCG	1	18	5.556
OPV	10	18	55.56
HEP.B	0	18	0
DPT/HIB	0	18	0
Measles	1	18	5.556
Y/Fever	0	18	0
TT	0	18	0
DPT B	0	18	0

Tables 12: The Mean Temperature Monitoring By Antigens During The First Quarter Of Year 2004 I At The Central Level (EPI Cold Chain), At The Health Divisional Level And At The Health Facilities Level (EPI Storage Facilities)

HS	January 2004		February 2004		March 2004	
	Min	Max	Min	Max	Min	Max
EPI	-19.6	-12,4	-19,7	-12.5	-1.15	5.425
URD	-15	-11	-15	-11	3.3	5.7
WD	-19.3	-13	-19.3	-13	3.7	5.3
NBED	-4.3	-3,3	-4,3	-3.3	-3.3	6
CRD	-17	-8	-17	-8	3.3	6.3
PHF	1.4	6.4	1.91	-9.56	2.3	6.3

Tableau 13: Supervision Activities in Vaccine Utilization and Wastage

Supervision activities	Number of HD	%	95% CI
Last month	5	83.3	35.9-99.6
Two months ago	1	16.7	0.4-64.1
Over three months ago	0		
TOTAL	6	100	
	Number of PHF		
Last month	11	61.1	35.7-82.7
Two months ago	1	5.6	0.1-27.3
Over three months ago	6	33.3	13.3-59.0
TOTAL	18		

Appendix 2: Health Divisions And List Of Public Health Facilities Visited

Level	Structures visited
Central	Central EPI Vaccine Store
Western Division	Leman Street Clinics
	Gunjur Minor Health Center
	Brikama Health Center
	Bwaim Hospital
	Fajikunda Health Center
	Sukuta Health Center
Lower River Division	Bureng. Health Center
	Kwinella Health Center
North Bank West Division	Essau Major Health Center
	Kerewan Health Center
	Illiassa Health Center
	NGange Sanjal Health Center
Central River Division	Bakau Minor Health center
	Kudang Health Center
	Dankunku Health Center
Upper River Division	Gambissara Health Center
	Baja Kunda Dispensary
	Fato minor Health Center

Appendix 3: The questionnaire

VACCINE WASTAGE ASSESSMENT AT THE CENTRAL LEVEL

May 21st - June 1st 2004

Name of the interviewer -----

Cadre of staff interviewed

Date of interview ____/____/____

VACCINE UTILIZATION AND WASTAGE (MANAGEMENT, SUPPLY AND DEMAND)

1-1	Do you have proper ledgers in place?	Yes	No
1-2	Are they being used?	Yes	No
1.3 If No, why not?			
1-4	Do you supply EPI returns, which include vaccine usage, and wastage forms?	Yes	No
1-5	Has the EPI program looked into smaller vials to cut down on wastage?	Yes	No
1-6	How frequently do you receive vaccines?	Once a year	
		Twice a year	
		Three times a year	
		Four times a year	
1-7	From January to March 2004, have you ever experienced any shortage of vaccine?	Yes	No
1.8 If Yes, list the antigens			

1-9	Do you monitor the temperature of your refrigerator?	Yes	No
1.10	If No, why not?		
1-11	Fill the minimum and the maximum temperatures in the table provided below	Minimum (Mean)	Maximum (Mean)
	January 2004		
	February 2004		...
	March 2004		
1-12	When did you last go on supervision?	Last month	
		Two months ago	
		Over three months ago	

Appendix 3: The questionnaire

VACCINE WASTAGE ASSESSMENT AT THE HEALTH DIVISIONAL LEVEL

May 21st - June 1st 2004

Name of the interviewer -----

Cadre of staff interviewed

Date of interview ____/____/____

VACCINE UTILIZATION AND WASTAGE (MANAGEMENT, SUPPLY AND DEMAND)

1-1	Do you have proper ledgers in place?	Yes	No
1-2	Are they being used?	Yes	No
1.3	If No, why not?		
1-4	Do you supply EPI returns, which include vaccine usage, and wastage forms?	Yes	No ...
1-5	Have you been trained in proper record keeping on vaccination returns?	Yes	No
1.6	If No, why not?		
1.7	How frequently do you request vaccine?	Once a year	
		Twice a year	
		Three times a year	
		Four times a year	
		Not applicable	

1.8	How frequently do you receive vaccine?	Once a year	
		Twice a year	
		Three times a year	
		Four times a year	
		Not applicable	
1.9	From January to March 2004, have you ever experienced any shortage of vaccine?	Yes:	No
1.10	If Yes, list the antigens		
1.11	Do you monitor the temperature of your refrigerator?	Yes	No
1.12	If No, why not?		
1.13	If Yes, Fill the minimum and the maximum temperatures in the table provided below	Minimum (Mean)	Maximum (Mean)
	January 2004		
	February 2004		
	March 2004		
1.14	When did you last go on supervision?	Last month	
		Two months ago	
		Over three months ago	

Appendix 3: The questionnaire

VACCINE WASTAGE ASSESSMENT AT THE PUBLIC HEALTH FACILITY LEVEL

May 21st - June 1st 2004

Name of the interviewer -----

Cadre of staff interviewed

Date of interview ____/____/____

1.1	Do you have proper ledgers in place?			Yes	No
1.2	Are they being used?			Yes	No
1.3 If No, why not?					
1.4	Do you supply EPI Monthly return forms, which include vaccine usage, and wastage forms?			Yes	No
1.5	If Yes, fill in the table below from January to March 2004				
Vaccine Management Forms					
	Antigen	Stock beginning	Stock received	Immunization given	Stock end
	BCG				
	OPV				
	HEP.B				
	DPT/HIB				
	Measles				
	Y/Fever				
	TT				
	DPTB				

1.6	Do you reuse opened vials of DPT vaccine in subsequent clinics?	Yes	No
1.7 If No, why not?			
1.8	Have you been trained in proper record keeping on vaccination returns?	Yes	No
1.9 If No, why not?			
1.10	How frequently do you request vaccine?	As required	
		Weekly	
		Once a month	
		Twice a month	
		When the stock is low	
1.11	How frequently do you receive vaccine?	As required	
		Weekly	
		Once a month	
		Twice a month	
		When the stock is low	

1.12	From January to March 2004, have you ever experienced any shortage of vaccine?	Yes	No
1.13	If Yes, list the antigens		
1.14	Do you monitor the temperature of your refrigerator?	Yes	No
1.15	If No, why not?		
1.16	Fill the minimum and the maximum temperatures in the table provided below	Minimum (Mean)	Maximum (Mean)
	January 2004		
	February 2004		
	March 2004		
1.17	When were you last supervised?	Last month	
		Two months ago	
		Over three months ago	

Appendix 4: The Budget

		Quantity	Cost	Total cost
Personnel	National consultant	12	25 000	300 000
	Supervisors (HD Focal point)	12	15 000	180 000
	Interviewer (Health Facilities Focal point)	12	15 000	180 000
	Sub1			660 000
Feedback	Reproducing/Copy of document /Stationery	Forfeit	71 000	70 200
	Sub2			70 200
	All			730 200

NB: We only take account of personnel and stationary in this study. We use resources from the current Injection Safety Practice survey to perform this study.