

ERITREA EPI COVERAGE SURVEY REPORT

DECEMBER 2000



**THE STATE OF ERITREA
MINISTRY OF HEALTH**

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EXECUTIVE SUMMARY

The National EPI coverage survey in Eritrea was carried out in December 2000 to verify the reported immunization coverage, identify reasons for not immunising and make recommendations for strategies and interventions that will enhance the achievement and sustainability of EPI planned activities. The target age groups were children aged 12 – 23 months to assess infant immunization and mothers of children aged 0 – 11 months to assess tetanus toxoid immunization among women.

The country was divided into 3 study areas according to the reported immunization coverage from the 6 zones. Thirty clusters were selected from each of the study areas making a national total of 90 clusters. Data collection was carried out between 11th and 20th December 2000.

Information on infant immunization was obtained from 647 children aged 12 – 23 months of whom 91.7 % had immunization cards. National coverage by antigen (card and history) was BCG 98.1 %; DPT1/OPV1 97.4%; DPT3/OPV3 92.8%; and Measles 88.2 %. National coverage by antigen (card only) was BCG 98.3 %; DPT1/OPV1 97.8%; DPT3/OPV3 93.6%; and Measles 82.5 %. Eighty seven percent of the children were fully immunized by card and history; 86.7% fully immunized (card only) and 82.5% were fully immunized by one year (card only).

DPT1 to DPT3 and BCG to Measles drop out rates were 4.6% and 10.1% respectively. Almost every child has access to immunization services as evidenced by a high DPT1 crude coverage of 97.4%, which is used as an indicator of access to immunization services. Majority of the immunizations are received from static units. Displacement due to the current conflict was the main reason given for none immunizing/partial immunization by the few mothers/guardians who had not immunised their children.

All children surveyed were eligible for NIDs 2000 and 98 % and 99 % of the children had received OPV during the 1st and 2nd round of NIDs 2000 respectively. This almost tallies with the reported national NIDs 2000 coverage of 91% and 90% in the first and second rounds respectively.

A total of 658 mothers of children aged 0 –11 months were interviewed of whom 72.8 % had cards. TT coverage (card and history) was TT1 92.7%, TT2 86.9%, TT3 66.0%, TT4 44.2% and TT5 28.9%. Only 55.8 % of the children were born protected against neonatal tetanus as evidenced by card, yet majority of the deliveries (54.2%) occur at home.

The surveyed immunization coverage, both for infants and women that reflects mostly the immunization coverage of 1999, is much higher than the reported coverage for the same year with high card retention among children.

Updated information on population should be made available to the zoba health offices and health facilities so that they can prepare more accurate reports on coverage for their target areas. Outreach services need to be increased in Study Area 3 in order to reduce the measles dropout rate. Vitamin A supplementation together with measles immunization should be included in the routine immunization program.

The Immunization program should aim at maintaining the achieved immunization coverage and improve on those shortfalls that were identified during the EPI program review.

1.0 INTRODUCTION

Eritrea is located in the horn of Africa. It is bounded by the Sudan to the North and West, The Red Sea to the North-East, Ethiopia to the South and the Republic of Djibouti to the South-East. The country has a surface area of about 124,000Km² - about the size of Greece. The country is divided into three physiographic regions: the central highlands, the western lowlands and the eastern lowlands .

There are six zones and 56 sub-zones which manifest distinct climatic characteristics. The high lands with an average elevation 2000 meters above sea level cover part of Northern red sea, Central, South and Anseba zones. The highlands are the most densely populated part of the country. The western lowlands include GashBarka as well as part of Anseba zone and have an average elevation of 1000 meters. The Eastern lowlands incorporate Northern red sea and Southern red sea, mainly constituted by the red sea coastal plains. The average elevation here is about 500 meters but the Denkalia depression is, in fact, 100 meters below sea level.

1.1 STATUS OF EPI

Ministry of Health (MoH) of the State of Eritrea launched the EPI program in 1980. However, before liberation only small portions (less than half) of the urban areas of the country were covered. Hence, a nation wide expansion of the program was possible only after the liberation in 1991.

The main objective of the program is to reduce morbidity and mortality due to vaccine preventable diseases i.e. measles, tuberculosis, diphtheria, pertussis, tetanus and polio. The specific objectives are to vaccinate children under one year against the above diseases and mothers against tetanus with tetanus toxoid. To achieve these objectives daily immunization of children and mothers at static and outreach sites are carried out. Immunization is integrated with other activities at health facilities (hospitals, health centers and health stations) and at village outreaches.

The following table reflects the achievements made in strengthening service delivery and increasing immunization coverage in the last six years.

Table 1: Immunization coverage for Eritrea 1994-1999

	1994	1995	1996	1997	1998	1999
No of static sites	85	125	170	190	215	205
No. of outreach sites	75	45	105	135	165	207
BCG (%)	45.0	52.2	52.2	67.4	70.0	65.5
OPV ₃ DPT ₃ (%)	36.0	42.3	46.1	60.7	60.0	56.6
Measles (%)	27.0	35.0	39.0	53.4	52.0	54.0
TT ₂ + (pregnant women) %	5.0	19.3	22.8	32.4	34.0	21.1

Source: EPI Unit/MOH

2.0 OBJECTIVES OF THE COVERAGE SURVEY

2.1 General objective

This coverage survey had an overall aim of providing data on immunization coverage of all EPI antigens in Eritrea, identify reasons for not immunising and make recommendations for strategies and interventions that will enhance the achievement and sustainability of EPI planned activities.

2.2 Specific objectives

1. To establish the immunisation coverage for all six antigens among children aged 12-23 months.
2. To determine TT immunisation coverage among mothers of children aged 0-11 months.
3. To elicit reasons for not immunising children 12 – 23 months and other associated factors.
4. To know the NIDs immunization status among children aged 12-23 months.

3.0. METHODOLOGY

3.1 STUDY AREAS

For the purpose of this study, the country was divided into three study areas;

Area 1: Central and Anseba zones (to represent high performing zones)

Area 2: Gash Berka and Dehub zones (to represent medium performing zones)

Area 3: North and South Red Sea zones (to represent low performing zones)

(See Map Annex 1)

3.2. STUDY POPULATION

The study population was children aged 12 – 23 months to assess the infant immunization and mothers of children aged 0 –11 months to assess tetanus toxoid immunization among women. The survey started on 11th December 2000. Hence the target population was children who were born between December 11th 1998 and December 11th 1999 to assess the infant immunization and mothers of children born between 11th December 1999 and 11th December 2000 to assess tetanus toxoid immunization among women

3.3 SAMPLING METHODOLOGY

The WHO 30 cluster sampling methodology was used. To select clusters probability proportion to size sampling (pps), size being the number of people in a cluster, was used. A list of population by village/town (sampling frame) was obtained from Ministry of Local Government. In each study area 30 clusters were selected making a total of 90 clusters in the whole country. Annex 2 shows the list of clusters by study area. In each cluster, 7/8 children in the age group 12 – 23 months and 7/8 mothers of children aged 0 – 11 months were randomly selected after identifying the starting point.

3.4. TRAINING OF INTERVIEWERS AND SUPERVISORS

Two days training for thirty interviewers and six supervisors was conducted in Asmara. Interviewers were midwife students from Asmara Health Science Institute while the supervisors were staff from MoH headquarters with good knowledge of EPI (Annex 3 - list of the coverage survey team). Training included description of survey objectives, survey methodology and field testing.

The supervisors and interviewers were taken through the three types of survey forms for assessing child (12 – 23 months) immunization, finding out reasons for non-compliance and for assessing TT immunization of mothers of children 0 – 11 months that were prepared by the WHO external consultant and the national team leader. (Annex 4 – Questionnaires 1,2,3)

The training was facilitated by the national EPI manager, the national team leader and the WHO external consultant for the EPI survey. A training guide was prepared and distributed to supervisors and enumerators (Annex 5).

3.5. DATA COLLECTION

The survey started on 11th December 2000 up to 20th December 2000. Five teams of interviewers (2 per team) and 2 supervisors were deployed simultaneously to each of the study areas. Each team was expected to cover one cluster per day making a total of 6 days for data collection. A community leader guided the interviewers within the cluster.

Information on immunization of children and mothers was collected, wherever available, from the children and mother's EPI cards or history of immunization as provided from mothers or guardians of eligible children. Hence the interviewers determined history of immunization of children and mothers when EPI cards were not available.

The supervisors were expected to daily check on the completeness and accuracy of the filled in questionnaires and to see that the whole survey is conducted according to the guidelines provided by the facilitators/coordinators of the EPI survey.

3.6. DATA PROCESSING

Data entry, checking and analysis was done using EPI-INFO 6. Training was provided for 3 data entrants. Reporting of the results was prepared to reveal the EPI coverage of the 3 study areas and a national averages.

COSAS 4 program could not be used for data analysis because it could not accept year 2000. Validity is based on the presence of a card with a date when the vaccine was given.

4.0 RESULTS.

4.1 IMMUNISATION OF CHILDREN AGED 12-23 MONTHS.

A total of 647 children aged 12-23 months were recruited in the survey from the 90 clusters, 216 from Area 1, 211 from Area 2 and 220 from Area 3.

4.1.1 Crude immunization coverage

The crude coverage was defined as immunisation given, evidenced by card when available or by history from mothers/guardians. Crude coverage does not accurately measure the immunization coverage in terms of children properly immunised or actually protected against disease. The overall crude coverage was BCG 98.1%, OPV1/DPT1 97.4 %, OPV3/DPT3 92.8% and measles 88.2 %. Table 2 shows crude coverage by study area.

Table 2: Crude Immunisation Coverage by antigen for children 12-23 months (card and history) by Study area, Eritrea; December 2000.

Antigen	AREA1 (n = 216)	AREA 2 (n = 211)	AREA 3 (n= 220)	NATIONAL (n = 647)
BCG	216 (100%)	206 (97.6%)	213 (96.8%)	635 (98.1%)
OPV0	97 (44.9%)	51 (24.3%)	63 (28.6%)	211 (32.6%)
OPV1	216 (100%)	203 (96.2%)	211 (95.9%)	630 (97.4%)
OPV3	215 (99.5%)	191 (90.5%)	195 (88.6%)	601 (92.8%)
DPT1	216 (100%)	203 (96.2%)	211 (95.9%)	630 (97.4%)
DPT3	215 (99.5%)	191 (90.5%)	195 (88.6%)	601 (92.8%)
Measles	211 (97.7%)	184 (87.2%)	176 (80.0%)	571 (88.2%)
Fully immunised	211 (97.7%)	176 (83.4%)	173 (78.6%)	560 (86.6%)
Program Indicators				
Card available	212 (98.1%)	185 (87.7%)	196 (89.1%)	593 (91.7%)
Dropout rate DPT1 to DPT3	0.5%	5.9%	7.6%	4.6%
Dropout rate DPT1 to Measles	2.3%	9.4%	16.6%	9.4%
Overall dropout rate BCG to Measles	2.3%	10.7%	17.4%	10.1%
Access to Immunisation Services	100%	96.2%	95.9%	97.4%

4.1.2 Valid immunization coverage

Valid coverage was defined as immunisation given and evidenced by card. Validity was based on the presence of a card with a date when the vaccine was given. The supervisors manually checked validity of the interval between doses before data entry i.e. DPT/OPV1 and DPT/OPV2 interval of at least 4 weeks, DPT/OPV2 and DPT/OPV3 interval of at least 4 weeks and measles vaccine received at nine months of age at least. In this case, some of the children could have received the immunization above one year of age.

Majority of the children, 91.2 % (593) had their immunization cards available. Valid coverage was calculated basing on the number of children with cards. The overall valid coverage was BCG 98.3 %, OPV/DPT1 97.8 %, OPV3/DPT3 93.6 % and measles 88.4%. Table 3 shows valid coverage by study area.

Some children received measles vaccine before completing the other vaccinations hence percentage fully immunised is lower than the children who received measles vaccine.

Those fully immunised by one year of age were those who received all the vaccines before age 52 weeks and evidenced by card. Those fully immunised by one year of age are a good indicator of the quality of the program. In the case of Eritrea, the national average of fully immunized by one year is over 80% although study area 2 is below 80%.

Table 3: Valid Immunisation Coverage by antigen for children 12-23 months (card only) by Study area, Eritrea; December 2000. (n = number with card in study area)

Antigen	AREA1 (n = 212)	AREA 2 (n = 185)	AREA 3 (n = 196)	NATIONAL (n = 593)
BCG	212 (100.0%)	176 (95.1%)	195 (99.5%)	583 (98.3%)
OPV1	212 (100.0%)	174 (94.1%)	194 (98.9%)	580 (97.8%)
OPV3	211 (99.5%)	163 (88.1%)	181 (92.3%)	555 (93.6%)
DPT1	212 (100.0%)	174 (94.1%)	194 (98.9%)	580 (97.8%)
DPT3	211 (99.5%)	163 (88.1%)	181 (92.3%)	555 (93.6%)
Measles	206 (97.2%)	157 (84.7%)	161 (82.2%)	524 (88.4%)
Fully immunised	206 (97.2%)	150 (81.1%)	158(80.6%)	514 (86.7%)
Fully immunised by 1 year (card only)	191 (90.1%)	140 (76.1%)	158 (80.6%)	489 (82.5%)

Table :4 Crude immunization coverage, valid immunization coverage out of those who have Card only and valid immunization coverage with card out of the total children in the samples.

Antigen	Card + history (n = 647)	Card only (n = 593)	Card only* (n = 647)
BCG	635 (98.1%)	583 (98.3 %)	583 (90.1 %)
OPV1	630 (97.4 %)	580 (97.8 %)	580 (89.6 %)
OPV3	601 (92.8 %)	555 (93.6 %)	555 (85.8 %)
DPT1	630 (97.4 %)	580 (97.8 %)	580 (89.6 %)
DPT3	601 (92.8 %)	555 (93.6 %)	555 (85.8 %)
Measles	571 (88.2 %)	524 (88.4 %)	524 (81.0 %)
Fully Immunized	560 (86.6 %)	514 (86.7 %)	514 (79.4 %)

* Rates seen in this column are calculated out of the total children in the sample who were both immunized and non – immunized.

4.1.3 Comparison with reported immunization coverage

The surveyed infant immunization coverage both crude and valid is much higher than the reported immunization coverage of 1999. (Table 5) This may be attributed to the unknown denominator that is being used to calculate the routine immunization coverage since most people have been displaced due to the current conflicts.

Table 5: Reported and surveyed national immunization coverage by antigen.

Antigen	Reported Coverage 1999 (%)	Survey coverage Card and History (%)	Survey coverage Card only (%)
BCG	65.5	98.1	98.3
DPT1/OPV1		97.4	97.8
DPT3/OPV3	56.6	92.8	93.6
Measles	54	86.6	82.5

4.1.4 Immunization Program Indicators (see table 2)

- **Presence of card**

Presence of an immunization card is an indicator of safe keeping of the cards. Cards are well kept with over 90% of the children interviewed having their cards available. Mothers/guardians in Study area 1 kept their cards very well - 98.1% had cards available.

- **Utilisation of immunization Services**

DPT1 crude coverage is used as an indicator to show the level of access or utilisation of immunization services by the population. A rate of less than 90% implies that access to immunization services is not good. In Eritrea, access/utilisation of immunization services is very good as evidenced by crude DPT1 coverage of above 90% in all the study areas.

- **Program Continuity**

Dropout rates are used to measure program continuity. Dropout rate between the first and third doses of DPT or OPV is the best indicator of program continuity and follow-up of children in EPI. A dropout rate greater than 10% indicates a problem with completion of the immunization schedule.

The DPT1 to DPT3 dropout rate is less than 10% in all the 3 study areas with Study Area 1 having a very low dropout rate of < 1%. DPT1 to measles dropout rates are also less than 10% except in Study Area 3 where the rate is 16%. Study Area 3 consists of a nomadic population that may not be able to complete the immunization schedule due their way of living.

4.1.5 Factors possibly associated with immunisation coverage.

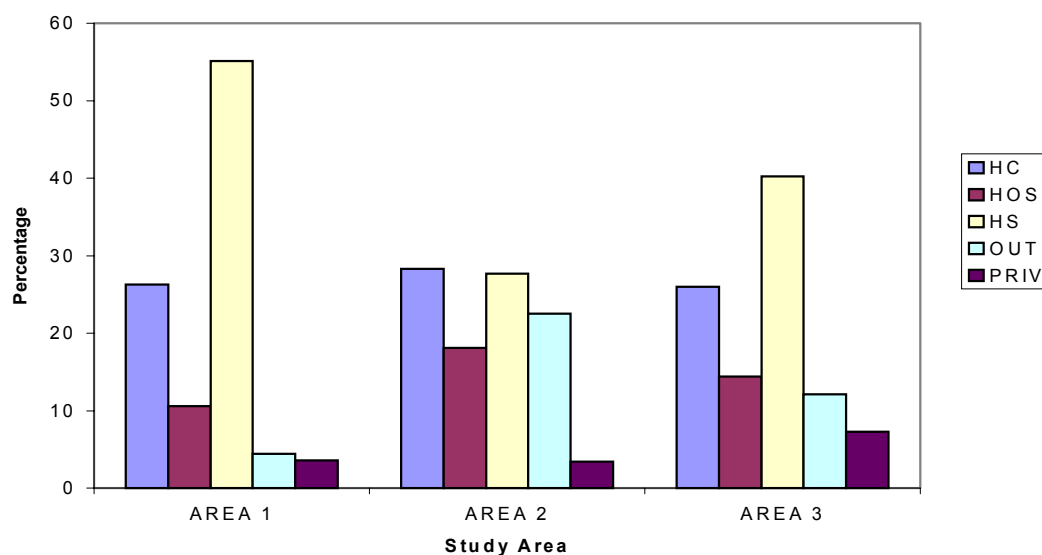
During the survey, questions on education level of mothers/guardians, distance to health units, time spent at the health unit during immunisation session were included to find out if they could be responsible for immunisation status. No association was obtained with any of these factors since majority of the children were immunised.

The good immunization coverage and card retention were partly attributed to the regulations from Ministry of Education that requires parents/guardians producing immunization cards for their children before being admitted to school.

Displacement due to the current conflict was the main reason given for none immunizing/partial immunization by the few mothers/guardians who had not immunised their children.

4.1.6 Sources of immunisation

Figure 1: Sources of immunization for Children 12 – 23 months by Study Area, Eritrea EPI coverage survey, December 2000



(HC = Health Centre, HOS = Hospital, HS = Health Station, OUT = Outreach, PRIV =Private /NGO)

Most of the children received immunization from static units especially health centres and health stations, with few children receiving immunization from outreaches.

4.1.6. NIDs Coverage among Children aged 12-23 Months.

All children surveyed were eligible for NIDs 2000 and 98 % and 99 % of the children had received OPV during the 1st and 2nd round of NIDs 2000 respectively. The reported national coverage for NIDs 2000 was 91% and 90% for the first and second rounds respectively, which is almost equivalent to the surveyed coverage.

Table 6 : NIDs coverage by study area, Eritrea; December 2000.

AREA	NIDs ROUND 1	NIDs ROUND 2
AREA1 (n = 216)	216 (100%)	216 (100%)
AREA2 (n = 211)	206 (97.6%)	208 (98.6%)
AREA3 (n = 220)	214 (97.3%)	218 (99.1%)
NATIONAL (N = 647)	636 (98.3%)	642 (99.2%)

4.2. TETANUS TOXOID IMMUNISATION OF MOTHERS OF CHILDREN AGED 0-11 MONTHS

4.2.1 Crude immunization coverage

A total of 658 mothers of children aged 0-11 months were recruited in the survey for evaluation of the TT immunisation. Of these 479 (72.8%) had TT cards. National TT2 coverage is 86.2% which shows that most children are born protected against neonatal tetanus. Evidence from card shows fewer children (55.8%) are born protected against neonatal tetanus. Results by study area are as shown in table 7 below.

Table 7. TT immunisation results for mothers of children aged 0-11 months (card plus history) by study area, Eritrea; December 2000.

Antigen	AREA1 (n=225)	AREA 2 (n=211)	AREA 3 (n=222)	NATIONAL (N=658)
TT1	223 (99.1%)	182 (86.3%)	205 (92.3%)	610 (92.7%)
TT2	216 (96.0%)	168 (79.6%)	188 (84.7%)	572 (86.9%)
TT3	167 (74.2%)	129 (61.1%)	138 (62.2%)	434 (66.0%)
TT4	117 (52.0%)	87 (41.2%)	87 (39.2%)	291 (44.2%)
TT5	83 (36.9%)	54 (25.6%)	53 (23.9%)	190 (28.9%)
Dropout rates:				
TT1-2	3.1%	7.7%	8.3%	6.2%
TT1-3	25.1%	29.1%	32.7%	28.9%
Card present	201 (89.3%)	136 (64.5%)	142 (64.0%)	479 (72.8%)
Children protected against NNT (card only)	176 (78.2%)	83 (39.3%)	108 (48.6%)	367 (55.8%)

4.2.2. Valid immunization coverage

Though about three quarters of the mothers had cards at home, it was not significant to obtain valid immunization coverage rates since the dates for initial immunizations (TT1) were not recorded on the cards of most mothers. Hence, as seen on table 7 analysis was based on card plus history.

4.2.3 Safe Delivery Indicators

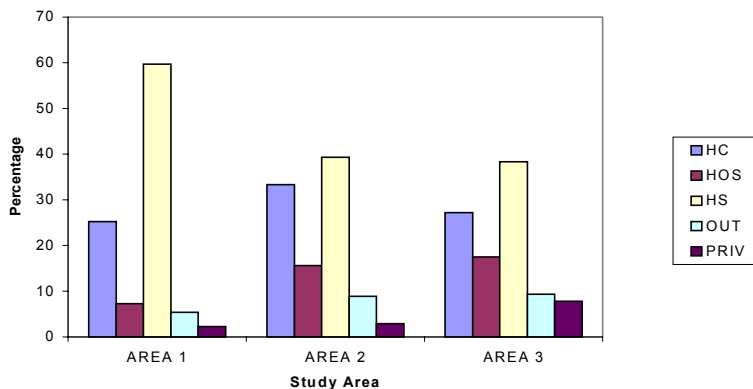
Mothers of children aged 0-11 months were asked questions about their antenatal and obstetric care during their most recent pregnancy to get an insight of the reproductive health programs in the country. A total of 658 mothers were interviewed. Most mothers (77.8%) especially in Study Area 3 attend antenatal clinics but deliver at home. This situation requires that mothers get TT immunization during antenatal care and any time they get in contact with health units, because the conditions under which they deliver at home are unknown which makes the children at risk of getting neonatal tetanus.

Table 8: Safe delivery Indicators for mothers of children 0 –11 months, by study area, Eritrea; December 2000.

MCH Indicator	AREA 1 (n =225)	AREA 2 (n = 211)	AREA 3 (n = 222)	NATIONAL (N = 658)
ANC Attendance	197 (87.6%)	148 (70.1%)	167 (75.2%)	512 (77.8%)
Other visits to health unit during pregnancy	47 (20.9%)	92 (43.6%)	63 (28.4%)	202 (30.7%)
Who assisted the delivery:				
Home	78 (34.7%)	154 (73.0%)	112 (50.4%)	344 (52.3%)
Health facility	110 (48.9%)	28 (13.3%)	52 (23.4%)	190 (28.9%)
Trained TBA	36 (16.0%)	26 (12.3%)	55 (24.8%)	117 (17.8%)
Other	1 (0.4%)	3 (1.4%)	1 (0.5%)	5 (0.8%)

4.2.4 Sources of immunization

Figure 2: Sources of immunization



(HC = Health Centre, HOS = Hospital, HS = Health Station, OUT = Outreach, PRIV =Private /NGO)

Most of the mothers received their immunization from static units especially from health centres and health stations. Few mothers receive immunization from outreaches.

5.0 CONCLUSIONS AND RECOMMENDATIONS

At the onset of this EPI community based household survey, three distinct areas where the coverage was high (Central and Anseba zones), medium (Gash Barka and Southern Debub zones) and low (North and South Red Sea zones) were identified. The result of the survey show a very high coverage in all the above study areas, with variation of coverage consistent with the above classification. The percentage of fully immunized children as evidenced by card and history was high (86.6%) with a high card retention of 91.2%

Immunization program indicators are good i.e. access to immunization services evidenced by DPT1 crude coverage was above 90% in all the three study areas with a national average of 97.4%; dropout rates are low around 10.0% except the BCG to measles dropout rate in Study Area 3. Majority of the children received immunization from static health units.

Vitamin A supplementation together with measles immunization at 9 months is not included in the routine immunization program.

The TT2 coverage based on card and history is above 80 %, slightly below in Study Area 2. This is better than what was obtained in the 1995 EPI coverage surveys and higher than what is reported routinely. The percentage of children born protected against neonatal tetanus based on card only was 55.8%. This may be an under estimate since some of the mothers did not have dates written on their cards. However majority of deliveries are taking place at home which requires that mothers receive protection against tetanus. Most of the mothers receive immunization from static health units.

It is recommended that updated, more complete and accurate information on population be made available to the zoba health offices and health facilities so that they can prepare more accurate reports on coverage for their target areas.

Vitamin A supplementation should be incorporated into the routine immunisation program.

There should be more outreach immunization services especially in Study area 3 to reduce on the dropout rate for measles, which is the last vaccine by the infants.

The Immunization program should aim at maintaining the achieved immunization coverage and improve on those shortfalls that were identified during the EPI program review.

ANNEX 2 (a):

STUDY AREAS AND CLUSTER/VILLAGES/TOWNS DISTRIBUTION

AREAS 1: CENTRAL AND ANSEBA ZONES

SOURCE DATA USED SAMPLING FRAME: ZOBA ADMINISTRATION

TOTAL POPULATION = 707,526

SAMPLING INTERVAL = 23,584

RANDOM NUMBER = 18475

Cluster No.	ZOBA/ZONE	SUB ZOBA/SUB ZONE	CENTRAL SUB ZOBA	VILLAGE ADMINISTRATION	NAME OF THE CLUSTER VILLAGE
1.	CENTRAL ZONE	SEREJEKA	SEREJEKA	ADI SHEKA	ADENGODA
2.	“	BERIK	TSADA CRISTIAN	HAZEGA	ADIBENEY
3.	“	BERIK	TSADA CHRISTIAN	TSADA CHRISTIAN	TSADA CHRISTEAN
4.	“	GALA NEFHI	MERHANO	ADI HAWESHA	ZIGEB
5.	“	ASMARA SOUTH EAST	ASMARA	CENTRAL TOWN	MAKEL KETEMA
6.	“	“	“	ADI ALEM	ADIS ALEM
7.	“	“	“	GODAIEF	GODIEFF KEHAWTA
8.	“	ASMARA NORTH EAST	“	ARBATE ASMARA	ARBATE ASMARA
9.	“	“	“	IDGA ARBI	IDAGA ARBI
10.	“	“	“	MAKELAIE SEFER	MAKELAIE SEFER
11.	“	ASMARA NORTH WEST	“	AKRIA	AKRIA
12.	“	“	“	HAZEHAZ	HAZEHAZ
13.	“	“	“	IDAGA HAMUS	IDGA HAMUS
14.	“	“	“	ADI ABEYTO	ADI ABETO
15.	“	ASMARA SOUTH WEST	“	TSETSERAT	TSETSERAT
16.	“	“	“	EXPO	EXPO
17.	ANSEBA	ADI TEKELEZAN	ADI FEKER	WARA	HABREWGIKA
18.	“	HABRO	AROTAY	FILFIL	ETENGAT TEHAT
19.	ANSEBA	“	HARBO TSELIM	AFAAYUN	AFAAYUN
20.	“	ELLABERID	EDEN	SHIB	ADI DERIO
21.	“	“	“	FERHEN	HANGEL
22.	“	GELEB	GELEB	GADMAIE/TSEBER	KABLO
23.	“	KERKEBET	KERKEBET	HARENAIET	KEJERAIET
24.	“	ASMAT	ASENADA	YAKARIE	YAKAREE
25.	“	HAGAZ	HAGAZ	HASHISAIE	MECHELEL
26.	“	“	“	HAGAZ TOWN	ZOBA ONE
27.	“	HALHAL	HALHAL	REHAIE	REHAIE
28.	“	AROUND KEREN	KEREN	ZONE ONE	ZONE ONE
29.	“	“	“	ZONE TWO	ZONE TWO
30.	“	“	“	ZONE FOUR	ZONE FOUR

ANNEX 2 (b):

STUDY AREAS AND CLUSTER/VILLAGES/TOWNS

AREAS 2 : GASH BARKA AND DEBUB ZONES

TOTAL POPULATION = 761367

SAMPLING INTERVAL = 25,378

RANDOM NUMBER = 14,756

Cluster No.	ZOBA/ZONE	SUB ZOBA/SUB ZONE	CENTRAL ZOBA	SUB	VILLAGE ADMINISTRATION	NAME OF THE CLUSTER VILLAGE
1	GASH BARKA	LOGO ANSEBA	MEKERKA		ADI HANNES	ADI HANNES
2	“ “	MENSUR	MENSSUR		ADE REDE	HAMED DERAR
3	“ “	“ “	“ “		TENSHAIE	TENSHAIE
4	“ “	DEGE	MGORAIEB		ADI HUSSIEN	ADASHET
5	“ “	“ “	“ “		TEKRERET	TEKRERET
6	“ “	MOLKI	MOLKI		ENDABASEMON	ENDABASEMON
7	“ “	BARENTU	AROUND BAARENTU		AROUND BARENTU	ZOBA AWEDA
8	“ “	GOGNE	GOGNE		ADI KESHE	ADI KESHI
9	“ “	“ “	“ “		“ “	“ “
10	“ “	FORTO	FORTO		HOMBI	AGELEN
11	“ “	“ “	“ “		MELAB	GERGER
12	“ “	HAYKOTA	HAYKOTA		ASSEFEDA AREDA	ADI KULE
13	“ “	TESSENIE	TESSENIE TOWN		TELATA AASHER	ADI AMER
14	SOUTHERN/DEBUB	DEKEMEHARE	DEKEMEHARE		AWLIE TSOR	AWLIE TSOR
15	“ “	“ “	“ “		MASSAWA TOWN	ZOBA 2
16	“ “	SEGENIET	SEGENIET		HALAIE	HADISH ADI
17		ADI KIEH	ADI KIEH		ADI KEIH	SIBIROSSO
18		MAIE MENE	MAIE MENE		ADI GOLAGUL	ADI MEWAGEE
19		“ “	“ “		ADI SHERETAIE	ADI BEREHTI
20	“ “	ADI QUALA	ADI QUALA		DAARO KUNAAT	DAARO KUNAAT
21	“ “	“ “	“ “		ADI QUALA TOWN	SOUTH ADI QUALA
22	“ “	DOBA RUBA	DOBA RUBA		ADI BEZEN	KAKBEDA
23	“ “	“ “	“ “		KEBTTA	DI ABRAHAM
24	“ “	MENDEFERA	MENDEFERA		ADI GUUBO	ADI GUUBO
25	“ “	“ “	“ “		ADI TSAWERA	ADI TSAWERA
26	“ “	IMENI HAYELI	IMENI HAYELI		ADI SHELEMOON	ADI SHELEMOON
27	“ “	AAREZA	AAREZA		ZEBAN DEBRI	ZEBAN DEBRI
28	“ “	“ “	ARAWETTI		ARAWETTI	MAHKUK
29	“ “	“ “	MAIE DEMA		MAIE DEMA	MAIE DEMA
30	“ “	MAIE AAYENI	MAIE AAYENI		QUAATIT	ADI FERTI

ANNEX 2 (c)

STUDY AREAS AND CLUSTER/VILLAGES/TOWN DISTRIBUTION

AREAS 3 : SOUTHERN AND NORTHERN RED SEA ZONES

TOTAL POPULATION = 459,981

SAMPLING INTERVAL = 15,333

RANDOM NUMBER = 14,467

Cluster No.	ZOBA/ZONE	SUB ZOBA/SUB ZONE	CENTRAL SUB ZOBA	VILLAGE ADMINISTRATION	NAME OF THE CLUSTER VILLAGE
1	SOUTHERN RED SEA	ARITTA	TIOO	AYUMEN	AYUMEN
2	“ “	SOUTHERN RED SEA	ASSEB TOWN	ABO	MEKAACA
3	“ “	“ “	“ “	WADO	WADO
4	“ “	“ “	“ “	MENDEK	ALEB
5	“ “	“ “	“ “	“ “	HARAK
6	“ “	“ “	“ “	“ “	GUAB
7	“ “	CENTRAL SOUTHERN RED SEA	IDDI	MABRA	MABRA
8	“ “	ASEBA TOWN	ASEBA TOWN	ADMIN.ONE	ADMIN ONE
9	“ “	“ “	“ “	ADMIN. TWO	ADMIN. TWO
10	NORTHERN RED SEA	NORTHERN RED SEA	KARURA	HALIBET	KARURA
11	“ “	“ “	“ “	MAHMEMIT	AWGET
12	“ “	“ “	“ “	ILABABU	ANKER
13	“ “	“ “	NAKFA TOWN	SHEKA	METTITTE
14	“ “	“ “	“ “	LABA	LABA
15	“ “	“ “	“ “	ENDALAL	BERJI
16	“ “	“ “	GELAALO	AADAIET	MAHLEGO
17	“ “	“ “	SHEIB	MENSHEB	DEGE
18	“ “	“ “	“ “	WEKIRO	WEKIRO
19	“ “	“ “	FORO	GERGEB	GEBGEB
20	“ “	“ “	“ “	AAIDUN	ZEB
21	“ “	“ “	AFAABET	AIETEHAL	AIETEHAL
22	“ “	“ “	“ “	KELHAMET	AWELE REYEM
23	“ “	“ “	“ “	MARSA GULBUB	MARSA GULBUB
24	“ “	“ “	“ “	MERAB AFFABET	MERAB AFAABET
25	“ “	“ “	“ “	“ “	WESHTI BAATSEI
26	“ “	“ “	MASSAWA TOWN	ADMIN. UNIT 01	HINTEBLO
27	“ “	“ “	“ “	ADMINUNIT 03	EMATEKALLA
28	“ “	“ “	GINDA	EMATEKALLA	EMBATEKELA
29	“ “	“ “	“ “	GINDA	ZOBA 01
30	“ “	“ “	“ “	“ “	ZOBA 02

ANNEX 3: LIST OF COVERAGE SURVEY TEAM

EPI Coverage Survey Steering Committee

1. Dr. Zemui Alemu - MoH, PHC Division Head
2. Ato Filli Said Filli - MoH, EPI Unit Head
3. Dr. Girmay Lijam - UNICEF EPI consultant
4. Dr. Ivan Camanor - UNICEF
5. Ato Debessai Haile - UNICEF
6. Dr. Girmay Andemicheal - WHO
7. Dr. Debrezion Berhe - WHO
8. Ato Mehari Weldab - National Team Leader (UNICEF)
9. Dr. Seruyange Rachel - WHO External Consultant

Participants in EPI Coverage Survey in six Zones - 10/12//2000 – 20/12/2000

	Name	Area	Tasks
1	Dr. Girmay Lijam	Anseba & Central	<i>Supervisor</i>
2	Tadese Fesahaye	Anseba & Central	<i>Supervisor</i>
3	Shishai Haile	Anseba & Central	Interviewer
4	Zaid weldegiorgis	Anseba & Central	Interviewer
5	Afia Said	Anseba & Central	Interviewer
6	Zewdi Habte	Anseba & Central	Interviewer
7	Elsa Tesfay	Anseba & Central	Interviewer
8	Letehawariat Yosief	Anseba & Central	Interviewer
9	Megdelawit Tsadu	Anseba & Central.	Interviewer
10	Zufan Abraha	Anseba & Central	Interviewer
11	Abrahamzion Hadgu	Anseba & Central	Interviewer
12	Ariam Weldu	Anseba & Central.	Interviewer
13	Emahazion T/Medhin	Anseba & Central	Interviewer
14	Abraham Tesfaselassie	Gash Barka & Debub	<i>Supervisor</i>
15	Adhanom Kidane	Gash Barka & Debub	<i>Supervisor</i>
16	Aida G/sllasse	Gash Barka & Debub	Interviewer
17	Zewdi G/medhin	Gash Barka & Debub	Interviewer
18	Tsega Tombossa	Gash Barka & Debub	Interviewer
19	Frewimni Zeru	Gash Barka & Debub	Interviewer
20	Signe Minase	Gash Barka & Debub	Interviewer
21	Mehari Ogbe	Gash Barka & Debub	Interviewer
22	Hiriti Estifanos	Gash Barka & Debub	Interviewer
23	Haimanot Isak	Gash Barka & Debub	Interviewer
24	Mebrat Zeru	Gash Barka & Debub	Interviewer
25	Askalu Tsegai	Gash Barka & Debub	Interviewer
26	Teklay Estifanos	Northern & Southern Red Seas	<i>Supervisor</i>
27	Embaye Asfaha	Northern & Southern Red Seas	<i>Supervisor</i>
29	Yayesh Tewledemedhin	Northern & Southern Red Seas	Interviewer
30	Destaghenet Haile	Northern & Southern Red Seas	Interviewer
31	Tesfamariam Mebrahtu	Northern & Southern Red Seas	Interviewer
32	Alazar Mehretab	Northern & Southern Red Seas	Interviewer
33	Zednghele Gorgrius	Northern & Southern Red Seas	Interviewer

34	Gidey Debass	Northern & Southern Red Seas	Interviewer
35	Zaid Debesai	Northern & Southern Red Seas	Interviewer
36	Almaz petros	Northern & Southern Red Seas	Interviewer
37	Pazion Araya	Northern & Southern Red Seas	Interviewer
38	Tekle Tesfamariam	Northern & Southern Red Seas	Interviewer
39	Mohamed Said Mahmud	Ministry of Health/HRD	Data Entrant
40	Ezra Kidane	Ministry of Health/HRD	Data Entrant
41	Amauel Kifle	Ministry of Health/HRD	Data Entrant
42	Aklilu Daneil	Ministry of Health/HRD	Data Entrant
43	Lemlem Tesfay	Ministry of Health/PHC	Data Entrant

ANNEX 5:

TRAINING GUIDELINE FOR CONDUCTING THE EPI COVERAGE SURVEY

The specific objectives of conducting the EPI coverage survey are:

- ◆ To identify children who are of the age between 12 and 23 months and mothers of children aged between 0 – 11 months in a cluster/village/town already selected;
- ◆ To find out whether these children and mothers are :
 - Fully immunized or
 - Partially immunized or
 - Not immunized
- ◆ To record the above status of immunization of the children and mothers and
- ◆ To find out the reasons for not being immunized.

To fulfill the above objectives we need to select the starting and subsequent household in a village/town already identified as a cluster and complete the cluster forms for;

- Children's immunization
- Reasons for immunization failure and
- Tetanus toxoid immunization of women.

Selecting the starting household

The first house to be visited in a cluster/village/town should be selected at random using the EPI random walk method. You should follow the following steps for selecting the first household.

1. Go to the central location of the cluster/village/town with a local guide who knows the locality very well; (*Please note that it is the population centre and not the geographical centre.*)
2. Randomly select the starting direction (e.g. giving numbers 1=N; 2=E; 3=S & 4 = W and randomly selecting one or by spinning a bottle/pen and choosing the direction where it points)
3. Give numbers to the houses(about 9 of them) found in the direction you selected above. Assign a number to each of the households (1 – 9) on small pieces of paper and randomly select one. For instance if you select randomly the number 7, the 7th household will be the first household to be visited.

B. SELECTING THE SUBSEQUENT HOUSEHOLDS

After selecting the first household, the second household to be visited will be the **one which is nearest to the first**. The next nearest household is the one whose front door is closest to the front door of the household you have just visited. Then after move clockwise (towards your right hand) from one household to the next nearest household.

In the survey you have to continue visiting houses within the cluster until the eighth child in the age range 12 – 23 months plus eight mothers of children aged 0 – 11 months have been located. At this point you would have completed one cluster.

C. COMPLETING THE CLUSTER FORMS

In the cluster form, list of questions to be asked (see the attached forms) at each household are provided with space to record information about at least seven children in each cluster selected for the study.

Introductory Data

For each cluster, fill in the following data by taking the information from your supervisor:

1. Cluster number
2. Village/Town
3. Zone/Zoba
4. Date and
5. House tally
6. Range of birth dates of children who are 12 to 23 months old to be studied in the clusters identified. Note, to determine the earliest acceptable birth date, subtract 24 month (to make it inclusive) from the date of interview. For example if the interview date is 10th December 2000 then the acceptable birth dates would be from 10th December 1998 (earliest date of birth) to 10th December 1999 (latest date of birth).

Each day of survey fill in the above 4 items of information before you start interviewing the first household. Then introduce yourself and explain the purpose of the survey.

QUESTIONNAIRE 1

To be filled if there is child 12 – 23 months i.e. child with acceptable birth date.

☛ **Name Of Child:** Write the name(s) of the Resident child in the household whose age(s) is/are between 12 – 23 months. Remember that the child might not be present for the interview but should be one who had at least spent the previous month in the household. Names of 7 children are required in each cluster, however if you get more than one child in the seventh household, one more spaces(8th child) is given to write the names of the additional child.

☛ **Household No:** Write the number of household for which you are carrying out the interview. You may have to label using a chalk if the house has no number.

☛ **Child Number:** This has already been printed and there is no need to write it again

☛ **Birth Date:** Write the birth date for each child whose name is written. If the birth date is not in the immunization card, ask the mother/guardian.

☛ **Sex:(M/F)** Write either M for male or F for female by asking the mother/guardian, in the space provided.

☛ **Immunization card:** Ask the mother/guardian to bring the immunization card, and write Y if the card is present or N if not found.

If the immunization card is present and the immunization was given, copy the date(s) of the immunization. On the other hand if the immunization card is not found, but the respondent says the child was immunized write + in the appropriate space provided. If the child was not immunized write “O” (zero). For BCG observe whether there is a scar and write either Y if present on N if no scar is observed or A if the child is absent.

For each type of immunization received, write the sources of the immunization using the following codes; **OUT** for outreach i.e. non-permanent place of vaccination, **HOS** for hospital, **HC** for health center **HS** for health station, or **PRIV**. for private/non-government (NGO) clinic. If mother does not know the source write ___.

☛ **Immunization status:** Determine the vaccination status of the child by putting ✓ in the appropriate space: i.e. if the child is known(by card/date or history 0) to be not vaccinated put ✓ mark in the box against None; if the child is vaccinated for some (not all put least for one) against Partial and if the child is Fully(8 dates or 8 + mark is written) vaccinated put ✓ mark in the box against Fully.

☛ **Fully < 1yr:** To be filled by supervisions as: Fully vaccinated before 1 year old write Y (yes) and if not write N (no) in the space provided.

☛ **Name of Interviewer(s):** On each page write your (interviewer) name and the supervisor should also write his/her name in the space provided after checking the filled questionnaire.

- ☛ **House tally:** Tally all households visited (even if there is no child of 12 - 23 year old). It helps to find out the number of households visited to interview 7 or more respondents (could be mothers or others).

For each child aged 12 – 23 months, after completing questionnaire 1, go to questionnaire 2 and fill in the appropriate questions.

NOTE: Interviewers should leave the “TOTALS” column blank. The supervisor will fill them in.

QUESTIONNAIRE 2

This is aimed at getting reasons for not immunizing and associated factors.

Interviewers, for each cluster fill the following;

- Cluster Number
- Village/Town
- Zone/Zoba
- Date

You can copy the above information from questionnaire 1.

- ☛ **Child number:** it is already written but should be same as that in Questionnaire 1.
- ☛ **Immunization Status:** Copy this data from Questionnaire 1.
- ☛ **Questions A, B, C & D:** The interviewer should ask all mothers/guardians the following questions irrespective of the immunization status of the child.

A. Mother/guardian’s education level. Put a tick (✓) where appropriate.

- None: if the mother/guardian did not attend any schooling and cannot read or write.
- Primary: if the mother/guardian can read and write and/or has attended school grade 1 – 6.
- Secondary: if the mother/guardian has attended school grades 7 – 11/12.
- Post-secondary: any school attendance above grade 11/12.

B. Distance in kms to the nearest health facility

Ask the mother/guardian to estimate the distance to the nearest health facility. Put a tick (✓) where appropriate either < 2 kms or 2 – 5 kms., or above 5 kms.

C. Interviewer : ask the mother/guardian how long she/he waited at the vaccination centre (health facility or outreach) for the child to be immunized. Put a tick (✓) where appropriate:

- None: For children who are not immunized
- < 30 minutes: if the mother waited less than 30 minutes(half an hour); or
- 30 – 60 minutes: i.e. more than 30 minutes (half an hour) up to 1 hour; or
- More than 1 hour: any time more than 1 hour.

D. Interviewer ask mother or guardian : Did you child receive polio vaccine in the last two campaigns (i.e. agitation made for polio vaccination)? Explain to mothers what oral polio means and the exact date on which the 2 campaigns were conducted. Then put either yes or no in the appropriate space.

- ☛ **IF THE CHILD IS EITHER NOT VACCINATED OR PARTIALLY VACCINATED ASK MOTHER/GUARDIAN FOR REASONS FOR NOT BEING VACCINATED.** Listen to the mother/guardian carefully and put ✓ where appropriate. Encourage/probe for the mother/guardian to give more than one answer if necessary.

NOTE: Interviewers should leave the “TOTALS” column blank. The supervisor will fill them in.

QUESTIONNAIRE 3

Cluster form for Tetanus Toxoid (TT) vaccination of mothers with children whose age is 0 – 11 months.

Once you have found a household where there is a child aged 0 – 11 months (i.e. infant less than one year old), fill questionnaire 3 in the following way;

- **CLUSTER NUMBER, VILLAGE/TOWN, ZONE/ZOBA, and DATE** as in questionnaire 1.
- **Mother's Name**: Record the name of the mother if a child is 0 – 11 months old is found in the household.
- **Household Number**: Write the house number in the cluster from which the mother has been identified.
- **Woman Number in Cluster**: Already written/printed.
- **Birth date**: Record the birth date of the child. This can be obtained from the mother's discharge form after delivery or the child's immunization card. If none of these is available then record the date as stated by mother.
- **TT card**: If a card or any other record (e.g. form) on which record of TT vaccination is made, is available, then write "YES" in the appropriate box. If the TT card is not available write "NO".
- **TT1 – TT5**: Put the date of the first or earliest dose of TT in the "Date/+ /O" box for TT 1. If any other of TT were given, record that in the "Date/+ /O" box for TT2, TT3, TT4 and TT5.

If an immunization card is not available, ask the mother if she has ever been immunized. Try to determine if the immunization was for tetanus by explaining that it is a vaccine given to mother's during pregnancy.

- If you are convinced that the mother received at least one dose put "+" in the "Date/+ /O" box for TT1.
- If the mother has received more than one dose of TT, put "+" in the "Date/+ /O" box for TT2, TT3, TT4 or TT5 (depending on how many doses she received). If possible try to verify the immunizations with records at the health units.
- If the mother has not received any TT, put "O" in the appropriate "Date/+ /O" box for the relevant dose.

Ask the mother where she received each immunization, and record this information in the relevant box in the row titled "SOURCE". Use the following abbreviations;

HOS = Hospital
HC = Health Centre
HS = Health Station
OUT = Outreach
PRIV = Private/NGO
____ = None

If the mother does not remember where she received the immunization, mark "O" in the box.

- **Antenatal care**: If the mother has been to one or more antenatal visits during the pregnancy with this child, write "YES" in the box. Otherwise write "NO".
- **Other visits**: If the mother visited any health facility for any reason other than antenatal care (sickness of mother, sickness of any other child, immunization of another child) during the last pregnancy, write "YES" in the box. Otherwise write "NO".
- **Delivery of Baby**: Put a tick (✓) in the relevant box for the place of delivery of this child. Remember that Home means delivery without trained TBA and Health facility is hospital, health centre or health station/clinic.
- **Child Protected**: This item will be filled by the supervisor. Interviewers should leave it blank.
- **Name of Interviewer(s)**: print your name as the interviewer

NOTE: Interviewers should leave the "TOTALS" column blank. The supervisor will fill them in.