

SUDAN

MULTIPLE

INDICATOR

CLUSTER

SURVEY

1995



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CHAPTER 1. SUDAN SYNOPSIS

The Sudan is the largest country in Africa with a land mass of 2.5 million square kilometers. The last National Census conducted in 1993 cited a population of 19.47 million in the North and 4.3 million in the South. The northern areas are fairly arid, barring the areas along the banks of the River Nile which are extremely fertile. The southern part of the country enjoys a tropical/equatorial climate and is potentially arable land. Temperatures are high with a maximum daily temperature between 29.4 and 46.1 degrees centigrade. The annual average rainfall is less than 50 mm in the far North, between 127 and 254 mm in Khartoum and between 760 and 1720 mm in the South.

The country is divided into 26 administrative states, with a State government responsible for each state. For the purpose of the survey, the country was divided into seven geographical zones (see page 4) The population density is concentrated at 163 per sq. km. in the state housing the capital, Khartoum, and unevenly dispersed among the other 25 States. The civil strife in the South has been the cause of a large displaced population in the Northern States. These, together with the remaining population in the Southern States, are the people who are most vulnerable, and in dire need of food, shelter, health services and basic education. Poor information networks and lack of proper data present large difficulties in dealing with these problems.

A limited infrastructure for provision of health facilities exists in most areas throughout the country. However, morbidity and mortality rates, especially from preventable diseases, are still unacceptably high. The health and education facilities in the South continue to deteriorate as a result of the prolonged civil war. Southern Sudan has experienced civil strife since 1955, with some interludes of peace.

The Pan Arab Project for Child Development (PAPCHILD) surveys conducted in 1993, indicated under-five mortality rate at 107 per 1000 live births. Diarrhoea related deaths among the under fives are estimated to constitute about 30% of total under-five mortality, whilst acute respiratory infections are responsible for about 34%. Malaria and other immunizable diseases contribute to the remaining. The situation is further complicated by malnutrition. The PAPCHILD survey indicated that 33% of under-fives were stunted, 13% suffered from wasting and 34% were underweight.

Deficiencies in micro-nutrients such as Vit A and Iodine together with complications of childhood diseases such as poliomyelitis, tetanus and meningitis, have resulted in a large number of disabled/crippled or mentally retarded children. In the South, drinking water is largely obtained from the surrounding rivers, and consumed without purification, continues to spread water-borne diseases. Of the 146,888 cases of dracunculiasis reported globally in 1996, Sudan has the highest number at 114,772 (Guinea worm wrap-up # 64).

CHAPTER 2. INTRODUCTION

The World Summit Declaration of 1990 identified 27 goals for the well-being of women and children to be attained by the year 2000. The Dakar Consensus under the organization of the OAU adopted 13 of these as Mid-Decade goals to be achieved by the year 1995. The mid-decade goals are therefore an integral and critical part of those objectives endorsed by the World Summit for Children.

Paragraph 34 (v) of the Plan of Action states that "each country should establish appropriate mechanisms for the regular and timely collection, analysis and publication of data required to monitor relevant social indicators related to the well-being of children . . . which record the progress being made toward the goals set forth in this Plan of Action and corresponding National Plans of Action".

Following this, the Federal Ministry of Health, Republic of Sudan, in collaboration with UNICEF and WHO, launched a National Programme of Action called "The Sudan Mid-Decade Goals Project Plan of Action" (SMDGPPA). This programme identifies strategies and priorities for achieving the 13 mid-decade goals (endorsed by the OAU) in Sudan by 1995. These goals are listed in the appendix. During a midterm review in 1993, it was decided to delay some of these goals to 1997.

In 1995, the Multiple Indicator Cluster Survey was adopted in Sudan as a tool for training people at State level to collect certain service indicators which would allow for rapid assessment of progress toward specific set goals. This rapid survey technique is a modification of the universally approved "EPI Cluster Survey Technique." The survey design allows for low cost and rapid production of data at various levels, which makes it useful as a monitoring tool at state/local level. It also allows for sub-national planning and regular monitoring. It aims to provide a more speedy and all-encompassing view of the current status of women and children with regard to monitoring the progress of the essential indicators targeted for the Decade goals.

It is hoped that this document will serve as a valuable and enduring national mechanism and as a central reference point for future monitoring of indicators in a systematic manner at sub-national or state level in achieving the Decade and Summit Goals.

CHAPTER 3. SURVEY DESIGN AND METHODOLOGY

The Multiple Indicator Cluster Survey is an adaptation of the EPI Cluster Survey sampling method which was introduced in 1974, by the World Health Organization. The EPI survey was intended to address the very limited objective of estimating immunization coverage rates.

Over the years, the design has been used for other purposes. While it is widely acclaimed for its low cost, simplicity and ease of operation, there have been various criticisms leveled at the technique - mainly dealing with the issues of bias and reliability. These have been overcome by various modifications to the design. These modifications are laid out in the Draft Handbook for Multiple Indicator Surveys.

The above named handbook was used as a guideline to develop an operational manual for use in the Sudan. The survey design consists of a series of questionnaire modules designed to provide data for some service indicators. These include vaccine coverage, vitamin A status, salt iodization, ORT use in diarrhoea, malnutrition, educational attainment, and the availability of water supply and sanitation facilities. The questionnaire modules have been adapted for use in the Sudan.

The survey design offers a rapid, dependable, low-cost and easily replicable system for monitoring progress. Because the questionnaire is simple, and the sample size manageable, the survey can be conducted, data analyzed and results released within a short period.

Sampling

According to the latest National Census, carried out in 1993, the Sudan is estimated to have a total population of 23.8 million, of which 4.3 million people live in the south of the country. This total includes about 3.5 million children under five and about 4 million children between the ages of 6 and 10 yrs. The total population is distributed among approximately 3.5 million households (HH) in the North, and 0.7 million households (HH) in the South.

The above statistics were used as the population basis for the sampling process for the Multiple Indicator Cluster Survey (1995).

The sampling units used to collect the data for the selected indicators were HH. A household means the group of people who usually live and eat together.

For the purpose of the survey, the country was divided into 7 zones as shown on the map (page 4). In each of the seven zones, systematic random sampling was used to select 30 clusters. 50 HH were selected in each cluster, to make a total of 1500 HH per zone. The 1500 selected HH were surveyed in each of the Northern six zones, but in the southern zone, only 1350 HH were actually surveyed, as the remaining were found to be inaccessible.

Map of Sudan



Sample zones:

Northern	- Northern - Nahr Al-Niel	Eastern	- Red Sea - Kassala - Gadarif	Kordofan	- Northern - Western - Southern	Central	- White Nile - Gezira - Sennar - Blue Nile
Darfur	- Northern - Western - Southern	Khartoum		South	- all 10 southern states		

Table 1. Age distribution of children under 10 years, by zone and sex

ZONE	Population	# HH	0-4 yrs		6-10 yrs	
			Male	Female	Male	Female
Northern	1,229,740	211,360	82,410	79,910	83,550	82,770
Eastern	2,658,130	498,370	197,190	199,940	217,090	212,320
Khartoum	3,252,410	530,740	212,010	204,920	210,270	209,950
Central	5,272,710	857,190	412,180	400,800	425,150	404,280
Kordofan	2,696,740	462,120	221,250	222,350	243,870	234,410
Darfur	4,357,380	768,700	373,450	372,170	417,580	388,990
Total North	19,467,110	3,328,480	1,498,490	1,480,090	1,597,510	1,532,720
Total South	4,321,788	665,656	327,710	263,243	445,793	333,301
GRAND TOTAL	23,788,898	3,994,136	1,826,200	1,743,333	2,043,303	1,866,021

Table 2. Age distribution of children under two years, by zone and sex

ZONE	0-11 mos	Male	Female	12-23 mos	Male	Female
Northern	32,020	16,360	15,660	26,630	13,700	12,930
Eastern	68,800	34,760	34,040	59,350	29,920	29,430
Khartoum	82,590	42,320	40,270	67,080	34,260	32,820
Central	148,630	76,480	72,150	129,860	65,730	64,130
Kordofan	84,930	42,710	42,220	61,230	30,110	31,120
Darfur	115,850	59,150	56,700	118,430	59,700	58,730
Total North	532,820	271,780	261,040	462,580	233,420	229,160
Total South	79,946	43,383	36,563	84,528	47,381	37,147
GRAND TOTAL	612,766	315,163	297,603	547,108	280,801	266,307

Table 3. Distribution of children under five years of age surveyed, by zone and sex

ZONE	U5 surveyed	male	%	female	%
Northern	1,051	525	49.95	526	50.05
Eastern	1,305	714	54.71	591	45.29
Khartoum	1,437	774	53.86	663	46.14
Central	1,524	780	51.18	744	48.82
Kordofan	1,631	786	48.19	845	51.81
Darfur	1,403	735	52.39	668	47.61
Total North	8,351	4,314	51.66	4,037	48.34
Total South	1,484	733	49.39	751	50.61
GRAND TOTAL	9,835	5,047	51.32	4,788	48.68

Table 4. Distribution of children 6 - 10 years of age surveyed, by zone and sex

ZONE	6-10 years	Male	%	Female	%
Northern	916	424	46.29	492	53.71
Eastern	856	493	57.59	363	42.41
Khartoum	1,106	554	50.09	552	49.91
Central	1,102	590	53.54	512	46.46
Kordofan	1,127	589	52.26	538	47.74
Darfur	848	438	51.65	410	48.35
Total North	5,955	3,088	51.86	2,867	48.14
Total South	834	448	53.72	386	46.28
GRAND TOTAL	6,789	3,536	52.08	3,253	47.92

CHAPTER 4. PLANNING AND PREPARATION

UNICEF, the Central Bureau of Statistics and the University of Khartoum were involved with the Ministry of Health in the planning and preparation of the first multiple indicator cluster survey in Sudan. A member of each of these institutions was sponsored by UNICEF to attend regional workshops on MICS, and a committee was formed to oversee the 1995 MICS.

Questionnaire

Following the guidelines for model questionnaires laid out in the Draft Handbook for Multiple Indicator Surveys, the questionnaire for Sudan was prepared in English and then translated into Arabic. This was done jointly by UNICEF, the Ministry of Health, University of Khartoum, Central Bureau of Statistics, the relevant sections in the Ministry of Higher Education and the National Department of Water Supply.

The model questionnaire for measuring the Mid-Decade Goals asks for the minimum information necessary to measure the chosen indicators. Short, specific questions using simple, everyday words are asked. One question is asked at a time. There is a clear flow from question to question, and a layout that makes it easy to administer. It provides all the information needed to calculate estimates of each indicator. It has instructions to interviewers that are clear and easy to distinguish from the questions to respondents. It is as easy as possible for interviewers to use, while ensuring that the data obtained is accurate.

The translated questionnaire was pre-tested in the community around Khartoum, with respondents similar to the respondents in the survey sample. This was done to identify problem areas, misinterpretations and cultural objections to the questions.

Training

A team of federal supervisors were trained by the committee during a one-day training period. Following this, the supervisors conducted a pilot survey in one cluster in the Khartoum state. These officers were then sent to each zone in order to train field supervisors and surveyors. The training, which followed guidelines on instructions to interviewers in Section 2.2 of the Draft Handbook for Multiple Indicator Surveys, lasted two days. It consisted of an explanation of the questionnaire and the methodology involved in conducting the survey, e.g., interviewing techniques, obtaining co-operation from respondents and maintaining standard procedures. The federal supervisors stayed in their allocated zone through the course of the survey.

CHAPTER 5. IMPLEMENTATION

One of the objectives of the survey conducted in March/April 1995 was to monitor progress of some indicators targeted for the mid-decade goals. This has been the first Multiple Indicator Cluster Survey organized as a national survey in the Sudan. Data collection was carried out by the federal and state ministries of Health in their respective zones. Health workers and local (state) ministries of Health staff were employed as interviewers after receiving 2 days of training on the procedures to be employed.

According to the designed plan, each cluster in the northern zones which consists of 50 HH was supposed to be surveyed by one team with two interviewers in one day. In each zone, six teams were recruited, thus it was targeted to finish within 5 working days. Realizing that the terrain in the South is relatively more difficult, instead of six, nine teams were recruited to cover all Government accessible areas in the ten southern states which have been determined as one unit of survey or equivalent to one zone of the North. It was targeted to finish the whole area in the South covering 1500 HH within four days.

The field situation, however, did not allow the teams to move as scheduled. Several constraints were encountered, such as transportation problems, unexpected rain, poor road condition between clusters, uncertain schedule of flights and other difficulties. Even in the South the teams discovered that two selected clusters were not accessible at that time due to insecurity. As a result only 1350 HH were covered in the South instead of 1500.

Due to the above operational difficulties, the duration of the survey was much longer than planned. This has resulted more man days involved and inflated the financial requirement for the field activities. The next Multiple Indicator Cluster Survey should consider and accommodate the operational aspects in a more flexible way.

Overall, the operational activities in the field of this survey was completed within 6 months.

CHAPTER 6. DATA ANALYSIS AND FINDINGS

Immunization

Morbidity and mortality rates of children under five due to immunizable diseases still remain high, and efforts are underway to sustain and increase the immunization coverage all over the country.

At more than 80%, the Northern and Khartoum zones have all achieved a fairly high coverage of dose 1 (DPT/OPV). The Central zone at 74.75% comes next. The Eastern zone has the lowest coverage at 50.80%. Throughout the country, it is fairly obvious that the 2nd and 3rd doses of the DPT/OPV vaccination have not covered as many as the 1st dose. In Darfur, only 28.62% of children between the ages 12 - 23 months were covered by dose 3. Total measles coverage for the North is 49.49%.

In the Southern zone, the DPT/OPV vaccination coverage with dose 1 was 57.76%, whereas with dose 3 it dropped to 32.85%.

The coverage with measles vaccine is 41.16%. Khartoum has the highest coverage with reference to all the above five antigens.

Table 5. Vaccination coverage among children 12-23 months surveyed in per cent

ZONE	Population 12-23 months	No. surveyed	DPT/OPV			Measles	Source Card
			1	2	3		
Northern	26,630	176	83.36	75.57	67.05	65.91	59.09
Eastern	59,350	250	50.80	44.40	41.60	40.80	35.20
Khartoum	67,080	285	83.16	79.65	64.91	70.88	53.68
Central	129,860	297	74.75	68.69	62.63	58.92	44.11
Kordofan	61,230	289	59.17	48.10	32.53	40.48	35.99
Darfur	118,430	269	51.30	41.64	28.62	32.34	33.09
Total North	462,580		65.50	57.91	47.83	49.49	41.32
Southern	84,528	277	57.76	46.93	32.85	41.16	39.35
GRAND TOTAL	547,108		64.30	56.21	45.52	48.20	41.02

With regard to the MDG, the above table indicates that much work needs to be done in the Eastern, Kordofan and Darfur zones, for the 80% achievement target to be realized throughout the country.

Control of Diarrhoeal Diseases

Dehydration and loss of essential salts are the major causes of mortality from diarrhoeal diseases. In combating the problem, the use of low cost approach and effective of Oral Rehydration Therapy has been the prime intervention to reach the goal for decreasing mortality due to diarrhoea related illnesses.

The Technical Guidelines for Monitoring Mid-Decade Goals is recommending three major strategies for reduction of mortality due to diarrhoea:

1. ORT (increased fluid) and continued feeding should be practiced in every family;
2. Every child seeking care outside the home should receive ORS;
3. Every health provider and health facility both government and private should offer correct case management for diarrhoea;

Table 6. Diarrhoeal incidence in the last 2 weeks among children under the age of two and five years.

ZONE	Under 2 surveyed	w. diarrhoea (%)	Under 5 surveyed	w. diarrhoea (%)
Northern	395	32.66	1,051	25.02
Eastern	587	36.29	1,305	29.89
Khartoum	581	35.28	1,437	26.17
Central	581	39.24	1,524	27.10
Kordofan	601	32.95	1,631	23.73
Darfur	459	40.74	1,403	28.37
Total North		37.31		27.04
Southern	618	56.80	1,484	40.97
GRAND TOTAL		40.07		29.35

It is evident from the above table that levels of children suffering from diarrhoea is fairly high, especially in the South. A recent survey indicated that children aged 0-4 years suffer an average of seven episodes of diarrhoea per year.

In the North, the under-tuos in the Central and Kordofan zones seem to be in the worst situation with the prevalence rate at around 40%.

The table indicates that 37.31% children under two in the North and 56.80% children under two in the South were suffering from diarrhoea in the two weeks preceding the survey.

Meager access to clean water and inadequate sanitation facilities together with poor personal hygiene are the major causes of diarrhoeal diseases.

Prior to 1993, Oral rehydration Therapy (ORT) was defined as the administration of oral rehydration salts and or recommended home fluids. It is now changed and is defined as increased intake of acceptable fluids, which include plain fluids available in the home. (Technical Guidelines for Monitoring Mid-Decade Goals). Examples of recommended home fluids: cereal based porridge like sorghum, rice, maize, millet etc. with salt in it; breast milk, yoghurt drink, soups etc.

Table 7. Treatment of Diarrhoea among the under-fives in per cent

ZONE	Treatment					
	Nothing	ORS	Home Fluid	Drug	Other	Unknown
Northern	26.62	22.81	12.17	28.52	5.70	4.18
Eastern	37.18	27.69	6.15	10.26	12.05	6.67
Khartoum	25.80	10.11	18.09	36.70	3.72	5.59
Central	30.27	4.60	23.00	28.33	7.99	5.81
Kordofan	18.09	10.85	32.04	25.06	10.34	3.62
Darfur	28.39	9.80	8.04	24.87	19.10	9.80
Total North	28.41	11.85	16.56	25.48	11.12	6.59
Total South	18.91	34.87	4.77	32.73	8.72	0.00
GRAND TOTAL	26.21	17.17	13.84	27.16	10.57	5.07

In most of the northern zones, the use of drugs for treating diarrhoea seems to be a preferred method, as contrasts with the South which might be due to poor supply of drugs in those areas.

It is evident from the above table that the use of ORS falls drastically short of the target goal of 80% in all zones.

In recent years, WHO and UNICEF have been placing greater emphasis on an increased volume of fluid intake. When given with continued feeding, the food can provide the required salt and carbohydrate or protein (needed to transport the salt and water into the body) and the composition of the fluid itself is therefore less important (provided certain harmful fluids are avoided). Continued feeding is not only critical for its role in rehydration but is also most important for the child's nutritional well-being. Based on this, water is considered to be an accepted home fluid provided feeding is continued. (Technical Guidelines for Monitoring Mid-Decade Goals).

If we consider home fluid as a form of ORT, the picture looks a little higher, as the graph (below) shows, but total ORT usage is still at the rate of 28.4% in the North, and 39.6% in the South.

Graph 1. ORT Use-rate among children under five years of age with diarrhoea

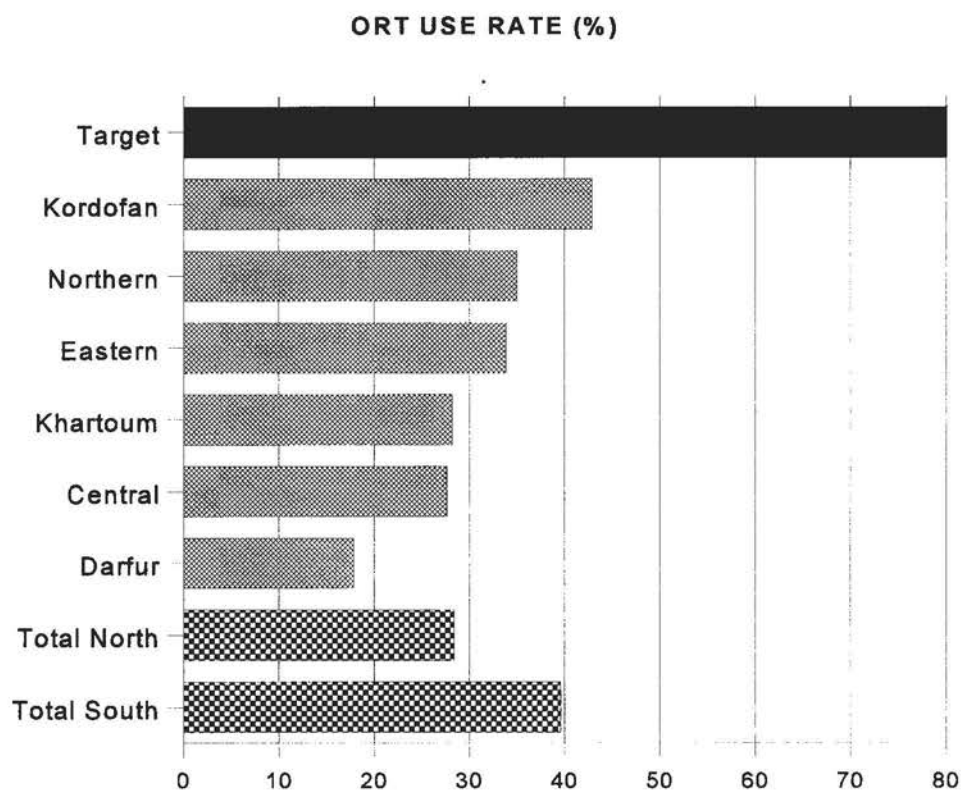


Table 8. Amount of **liquid** given to children under fives surveyed during diarrhoea in per cent

ZONE	# of cases	increased	as it is	decreased	stopped
Northern	263	35.74	52.09	8.75	3.42
Eastern	390	32.05	61.79	4.62	1.54
Khartoum	376	40.43	46.01	12.50	1.06
Central	413	46.49	46.00	5.81	1.69
Kordofan	387	38.76	44.96	13.95	2.33
Darfur	396	19.85	63.82	14.32	2.01
Total North		34.99	53.18	9.99	1.84
Total South	608	47.86	41.12	10.36	0.66
GRAND TOTAL		37.96	50.39	10.08	1.57

It is interesting to note that in the majority of cases of diarrhoea in the North , liquid is either continued to be given to the child at the same rate (53.18%) or liquid intake is increased (34.99%) rather than decreased (9.99%). In the South, some 41% of children suffering from diarrhoea continue to be given liquids at the normal rate. A larger number (47.86%) have an increased liquid intake, whilst some 10% are given less liquids.

Table 9. Amount of **food** given to children under fives surveyed during diarrhoea in per cent

ZONE	# of cases	increased	as it is	decreased	stopped
Northern	263	13.31	65.78	14.83	6.08
Eastern	390	11.28	64.62	11.54	12.56
Khartoum	376	7.18	54.79	34.31	3.72
Central	413	4.84	57.14	30.75	7.26
Kordofan	387	11.37	52.97	29.72	5.94
Darfur	396	13.32	64.57	18.59	3.52
Total North		9.61	59.77	24.27	6.35
Total South	608	27.14	49.34	20.56	2.96
GRAND TOTAL		13.66	57.36	23.41	5.57

Where food is concerned, table 9. shows that on average in the North, the majority of mothers/caretakers continue to give the child food at the same rate (59.77%). It seems that reducing intake of food during diarrhoea is still practiced (24.27%), only 9.61% increase the food intake. While in the South 27.14% of the children suffering from diarrhoea have their food intake increased, 20.56% have a reduced food intake, and 9.34% are given food at the same rate.

Table 10. Person who treated diarrhoea among the under-fives surveyed in per cent

ZONE	# of Cases	Health worker	Mother	Traditional healer	Other	Don't know
Northern	263	49.43	25.10	0.76	1.52	23.19
Eastern	390	22.56	35.13	1.03	3.85	37.44
Khartoum	376	45.48	26.33	0.27	0.00	27.93
Central	413	32.93	36.32	1.45	0.24	29.06
Kordofan	387	31.27	49.10	2.07	1.29	16.28
Darfur	396	14.32	51.01	6.53	0.50	27.64
Total North		28.83	39.75	2.61	1.01	27.80
Total South	608	49.34	26.81	6.09	0.00	17.76
GRAND TOTAL		33.57	36.76	3.41	0.78	25.48

Most of the cases are treated either by the mother or the health worker. The survey shows that the role of traditional healer and other is not significant in treating children with diarrhoea. This suggests that training and health education are required to promote ORT use to mothers and health workers.

Another important factor is mother's attitude on breast-feeding during diarrhoea. The survey shows that more than 80% of mothers both in the North and the South continue to breast-feed their babies during their bouts of diarrhoea. Only 1.82% in the North and 3.40% in the South stopped breast-feeding, with others decreasing the numbers or duration of feeds as shown in table 11.

Table 11. Attitude on breast-feeding during Diarrhoea among children less than 2 years surveyed.

ZONE	# of Under 2 Breast-fed	% with Diarrhoea	Breast-feeding (%)		
			Continued	Stopped	Decreased
Northern	358	32.12	82.61	4.35	13.04
Eastern	466	37.55	78.86	3.43	17.71
Khartoum	487	33.06	83.85	1.86	14.29
Central	479	39.67	83.68	1.05	15.27
Kordofan	529	33.08	82.29	2.86	14.85
Darfur	413	41.65	75.00	0.58	24.42
Total North		37.46	80.70	1.82	17.48
Total South	550	58.91	83.95	3.40	12.65
GRAND TOTAL		40.61	81.39	2.16	16.45

Table 12. Duration of breast-feeding among children under fives stopped breast-fed surveyed in per cent.

ZONE	# of Under 5 stopped breast-fed	Age in months when breast-feeding was stopped in per cent				
		0	< 6	6 - 11	12 - 17	18 - 24+
Northern	615	3.90	1.46	5.04	17.89	71.71
Eastern	760	12.11	3.03	6.58	22.63	55.66
Khartoum	893	1.57	2.02	8.62	18.14	69.65
Central	997	1.20	1.60	5.62	18.96	72.62
Kordofan	1,038	7.03	0.39	2.60	19.08	70.91
Darfur	882	0.23	0.68	2.83	15.53	80.73
Total North		3.38	1.41	4.97	18.40	71.84
Southern	789	13.94	1.01	2.66	10.65	71.74
GRAND TOTAL		4.90	1.35	4.64	17.28	71.83

The figures show that the level of breast-feeding (at least up to 12 months) in most states is still around the 95% mark. At 99.09 %, the Central zone has the highest number of breast-fed children. The Eastern zone, however, shows a marked difference in pattern, with only 84.87% of the infants being breast-fed up to 12 months and a mere 55.66% up to 24 months.

In the South 71.74 % of the children are breast-fed up to 24 months. Furthermore, all the above data relating to breast-feeding has provided no statistics on supplementary feeding. It is suggested that the new questionnaire for the second Multiple Indicator Cluster Survey ask whether the child is exclusively breast-fed or is provided with supplementary feeding.

An additional analysis was made on the incidence of diarrhoea among children who are still breast-fed and among those who are no longer breast-fed. It is believed that those who are breast-fed should have been less likely to suffer from diarrhoea rather than those who are not breast-fed. However, this survey revealed an inconsistent result especially in the South as shown in the table below.

Table 13. Incidence of diarrhoea among children surveyed by status of breast-feeding in per cent.

ZONE	Breast-fed			Not Breast-fed		
	# under 2	Diarrhoea	No Diarrhoea	# under 2	Diarrhoea	No Diarrhoea
Northern	358	32.12	67.88	37	37.84	62.16
Eastern	466	37.55	62.45	121	31.40	68.60
Khartoum	487	33.06	66.94	94	46.81	53.19
Central	479	39.67	60.33	102	37.25	62.75
Kordofan	529	33.08	66.92	72	31.94	68.06
Darfur	413	41.65	58.35	46	32.61	67.39
Total North		37.46	62.54		36.42	63.58
Total South	550	58.91	41.09	68	39.71	60.29
GRAND TOTAL		40.61	59.39		36.78	63.22

This has been taken as a useful lesson learned from the first experience in conducting a Multiple Indicator Cluster Survey in the Sudan to improve the quality of questionnaire as well as the questioning technique.

Acute Respiratory Infections

In Sudan, Acute Respiratory Infections (ARI) have been contributing significantly to the mortality rates in children. Recent records indicate that nationally 21% of under-five mortality is attributed to ARI.

Table 14. Incidence of ARI in the last 2 weeks among under-fives surveyed in per cent.

ZONE	# of Under-five	With ARI symptoms	Without ARI symptoms
Northern	1,051	39.11	60.89
Eastern	1,305	36.48	63.52
Khartoum	1,437	45.86	54.14
Central	1,524	47.44	52.58
Kordofan	1,631	44.45	55.55
Darfur	1,403	33.57	66.43
Total North		41.39	58.61
Total South	1,484	41.17	58.83
GRAND TOTAL		41.35	58.65

Cough is the most common symptom as one of the criteria for diagnosing ARI. The incidence rate of ARI symptoms for the North and the South is at around the 41% mark. That is to say that almost half the national population of children under five showed signs of ARI in the two weeks preceding the survey. Nose-block, fast breath, fever are recognized as other symptoms for diagnosing ARI.

Mothers and care-takers usually will seek treatment for the child when the child is suffering from disturbing symptoms. As far as ARI is concerned, fever is the most common symptom which lead the mothers and care-takers seek help, as shown in table 15. In the North, 42.84% of ARI cases seek treatment due to suffering from fever and similarly 54.34% of ARI cases in the South.

Very few mothers or caretakers seek treatment for loss of appetite. About 20% of mothers or caretakers in the North and some 15% in the South seek help for fast breath. Even lesser numbers seek help for nose blocks.

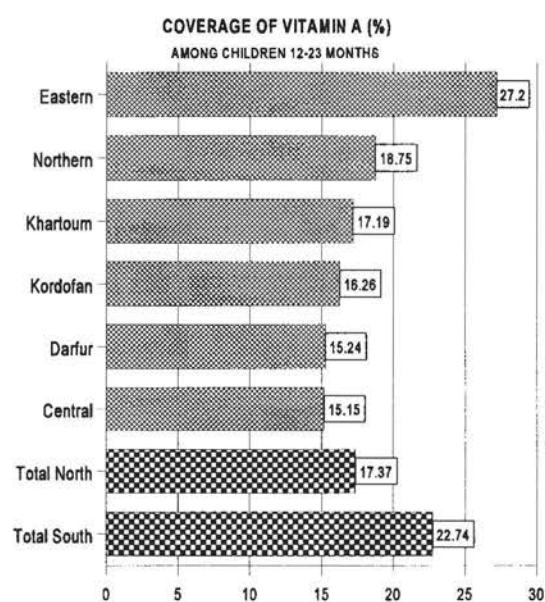
Table 15. ARI symptoms among children under 5 years surveyed which lead to mothers seeking treatment.

ZONE	ARI cases	No appetite	Nose block	Fast breath	Fever	Duration	Other
Northern	411	1.70	24.57	23.36	31.63	1.70	17.03
Eastern	476	2.10	9.66	21.43	34.03	4.20	28.57
Khartoum	659	2.88	4.70	27.92	57.51	1.82	5.15
Central	723	1.80	4.98	16.87	53.11	12.17	11.06
Kordofan	725	2.62	32.69	17.24	32.00	6.90	8.55
Darfur	471	5.73	27.60	17.62	32.27	3.82	12.95
Total North		2.93	15.52	19.67	42.84	6.55	12.49
Total South	611	2.45	9.33	15.06	54.34	6.06	12.77
GRAND TOTAL		2.85	14.50	18.91	44.74	6.47	12.54

Vitamin A Deficiency (VAD)

Available statistics on VAD show high prevalence rates among children, ranging between 0.4%-2.8% for night blindness, 0.9%-3.0 for Bitot's spots and 0.2 -0.5% for corneal ulcers .

Graph 2. Coverage of Vitamin A among children aged 12-23 months surveyed.



The survey committee realized that the age group surveyed was not completely correlated with the policy of vitamin A distribution in the Sudan. Vitamin A is administered targeting children between 6-23 months of age with one dose of vitamin A of 200,000 IU. Therefore, the survey should have shown a higher coverage if it would have been interviewing children more than 24 months instead of 12-23 months. In any case the result has been useful to compare the success or failure between states. Eastern zone has achieved the highest coverage in the North, while Central zone has been the lowest. Overall, the South achieved higher coverage than the North. This experience has been taken into consideration for improving the questionnaire for next Multiple Indicator Cluster Survey.

Universal Salt Iodization (USI)

In the Sudan, Iodine Deficiency Disorder (IDD) has been recognized as a public health problem since the 1950s. In the North, around 2.3 million people are estimated to be at risk of IDD. Of these, 1.5 million are estimated to be in the Darfur zone. Studies conducted in the 1980s indicated high goitre prevalence. Total Goitre Rate (TGR) is estimated to be 20% nation-wide, with a wide variation as seen below.

Red Sea states	13%
Khartoum	17%
Kordofan	68%
Central	75%
Darfur	87%

A survey in the South in the 1970s revealed goitre prevalence rates of 10 - 30%.

Universal Salt Iodization has been adopted as a national strategy to overcome the problem. Two main salt producers in Port Sudan with a capacity of producing about 80% of country requirement are preparing to produce iodized salt. In fact, iodized salt had not been available for most of the households at the time the survey was implemented. However, for the purpose of practicing the survey technique and methodology this indicator was included.

Table 16. Consumption of iodized salt among households surveyed

ZONE	# of Household	Yes	%	No	%
Northern	1,500	10	0.67	1,490	99.33
Eastern	1,500	9	0.60	1,491	99.40
Khartoum	1,500	6	0.40	1,494	99.60
Central	1,500	1	0.07	1,499	99.93
Kordofan	1,500	3	0.20	1,497	99.80
Darfur	1,500	1	0.07	1,499	99.93
Total North			0.26		99.74
Total South	1,350	1	0.07	1,349	99.93
GRAND TOTAL			0.23		99.77

Protein Energy Malnutrition (PEM)

In recent years, malnutrition (severe and moderate) has become an immense threat to children and women in the country nation-wide, as a result of natural disasters and the civil war in the South which caused displacement of large numbers of the population. This problem is intensified in the South.

The PAP Child Surveys done in 1993 revealed that 34% of under-fives were under weight (weight for age), 13% suffered from wasting (weight for height), and 33% were stunted (height for age).

The Multiple Indicator Cluster Survey, was using "weight for height" as the criteria to study the level of malnutrition. A child is considered moderately malnourished if his/her weight for height is less than 2 standard deviation of the median weight for height of the reference population for the same age and sex and severely malnourished if his/her weight for height is less than 3 standard deviation.

Table 20. shows a total malnutrition level of 16.51% in the North. Of these, 5.97% are severely malnourished and 10.54% moderately malnourished.

Table 17. Nutrition Status among children under-five years surveyed

ZONE	# Under-5 surveyed	Nutrition Status			
		Severe	%	Moderate	%
Northern	907	88	9.70	166	18.30
Eastern	1,133	88	7.77	132	11.65
Khartoum	1,375	40	2.91	137	9.96
Central	1,422	93	6.54	124	8.72
Kordofan	1,550	76	4.90	138	8.90
Darfur	380	19	5.00	16	4.21
Total North			5.74		8.71
Total South	1,290	187	14.50	175	13.57
GRAND TOTAL			7.19		9.51

The Northern and Eastern States suffer the highest level of malnutrition with 28% and 19.42% respectively of their under-five population. Darfur appears to be the most well off state with respect to under-five malnutrition at an overall rate of 9%. Of this, 5% are severely malnourished. In the South severe malnutrition is more prominent at the rate of 14.50% out of the overall malnutrition rate of 28.07%.

Basic Education

The mid-decade goals for basic education are to increase the enrolment rate to 70%, completion rate to 75% and reduce the disparity of girl/boy ratio to 0.8 by 1995. In addition the literacy rate among population 15-45 years of age to be increased to 36%.

Table 18. Primary school attendance among boys 6-10 years surveyed in per cent.

ZONE	Boys 6-10 yrs	Not attending	Class 1	Class 2	Class 3	Class 4
Northern	916	31.60	27.12	21.93	12.26	7.08
Eastern	856	41.18	20.69	17.65	14.00	6.49
Khartoum	1,106	28.88	25.27	23.83	16.43	5.60
Central	1,102	45.76	22.54	19.83	10.34	1.53
Kordofan	1,127	51.78	16.98	15.79	9.00	6.45
Darfur	848	43.61	26.03	15.53	10.96	3.88
Total North		42.53	22.95	18.43	11.70	4.40
Total South	834	37.95	37.28	14.51	6.92	3.35
GRAND TOTAL		41.53	26.08	17.57	10.65	4.17

It is clear from tables 21 and 22, that except for the Northern and Darfur zones, there is not very much disparity between the numbers of boys and girls who first enrol in Class 1. In fact in classes 3 and 4 in the Northern zone, the percentage of female 6-10 years old is higher than that of male.

In general, the overall rate of enrolment is very low in all zones, including Khartoum. The percentage of children who never attended school is rather high in most zones. Kordofan is in the worst position, with over 50% of school age children of 6 to 10 years of age are not getting any formal education.

It is quite disturbing that the percentage of children who actually attend class 4 is very small, 4.39% (male), 4.11% (female) in the North and 3.35 (male), 2.33% (female) in the South. It is clear that this is a result of children drop out from school and/or repetition. It is therefore, suggested that, the amended questionnaire for 1996 includes questions related to these issues. This should provide a more comprehensive picture of the situation.

Table 19. Primary school attendance among girls 6-10 years surveyed in per cent.

ZONE	Girls 6-10 yrs	Not attending	Class 1	Class 2	Class 3	Class 4
Northern	492	36.79	19.92	17.07	16.67	9.55
Eastern	363	50.69	18.18	15.43	10.74	4.96
Khartoum	552	35.33	23.55	20.83	12.86	7.43
Central	512	49.22	21.88	18.16	8.98	1.76
Kordofan	538	58.36	15.43	16.17	5.58	4.46
Darfur	410	53.17	21.22	14.88	7.81	2.93
Total North		49.25	20.34	16.95	9.35	4.11
Total South	386	41.71	37.05	13.47	5.44	2.33
GRAND TOTAL		47.90	23.32	16.33	8.65	3.79

Access to Safe Drinking Water

It is very well documented that unsafe drinking water is responsible for a lot of the diseases especially diarrhoeal prevailing in the country. The primary aim of the water goal is to improve the populations' access to safe drinking water.

Table 20. Source of drinking water in households surveyed in per cent

ZONE	# of HH	Main	Well	Rain/ Hafeer	River	Turaa	Other
Northern	1,500	57.87	12.80	0.00	24.67	0.67	4.00
Eastern	1,500	41.73	41.07	1.47	4.07	9.27	2.40
Khartoum	1,500	86.93	0.73	0.00	2.67	0.00	9.67
Central	1,500	59.73	10.33	8.87	3.93	13.80	3.33
Kordofan	1,500	77.67	13.20	6.00	0.00	1.67	1.47
Darfur	1,500	43.07	48.67	8.27	0.00	0.00	0.00
Total North		59.90	22.81	5.25	3.61	5.22	3.22
Total South	1,350	11.11	13.11	7.41	49.19	0.07	19.11
GRAND TOTAL		51.77	21.19	5.61	11.21	4.36	5.87

Table 21. Source of Domestic Water in households surveyed in per cent.

ZONE	# of HH	Main	Well	Rain/ Hafeer	River	Turaa	Other
Northern	1,500	59.20	20.67	0.00	16.80	0.67	2.67
Eastern	1,500	43.00	41.20	1.47	2.47	9.60	2.27
Khartoum	1,500	87.20	0.67	0.00	2.47	0.00	9.67
Central	1,500	59.60	7.47	8.87	3.87	16.87	3.33
Kordofan	1,500	77.60	11.40	4.93	0.07	3.33	2.67
Darfur	1,500	42.00	49.73	8.27	0.00	0.00	0.00
Total North		59.92	22.58	5.10	2.84	6.29	3.28
Total South	1,350	11.78	13.48	6.96	48.52	0.00	19.26
GRAND TOTAL		51.90	21.06	5.41	10.45	5.24	5.94

Table 22. Treatment of drinking water in households surveyed in per cent

ZONE	# of HH	Main	Boiled	Precipitated	Filtered	Other
Northern	1,500	96.67	0.33	1.67	1.00	0.33
Eastern	1,500	93.07	0.13	5.93	0.20	0.67
Khartoum	1,500	98.80	1.07	0.00	0.07	0.07
Central	1,500	88.13	0.53	0.27	11.00	0.07
Kordofan	1,500	99.33	0.20	0.13	0.00	0.33
Darfur	1,500	99.20	0.73	0.07	0.00	0.00
Total North		95.22	0.54	1.10	2.94	0.20
Total South	1,350	65.33	0.96	27.33	6.30	0.07
GRAND TOTAL		90.24	0.61	5.47	3.50	0.18

Access to Sanitary Means of Excreta Disposal

The primary aims of the sanitation goals are to improve the population's access to adequate sanitation facilities.

Table 23. Accessibility to type of sanitation facility in per cent.

ZONE	# of HH	Pit latrine	Syphon	Private	Common	Other	None
Northern	1,500	66.07	3.67	9.47	0.00	0.00	20.80
Eastern	1,500	21.53	1.80	9.20	0.00	0.07	67.40
Khartoum	1,500	70.93	0.47	9.13	0.40	0.07	19.00
Central	1,500	50.40	0.73	4.80	0.00	0.13	43.93
Kordofan	1,500	36.13	4.40	4.40	0.00	0.53	54.53
Darfur	1,500	55.00	0.33	0.00	0.13	16.33	28.20
Total North		49.43	1.45	5.28	0.09	3.90	39.84
Total South	1,350	23.85	0.44	0.74	0.07	9.63	65.26
GRAND TOTAL		45.16	1.28	4.52	0.09	4.86	44.08

The pit latrine seems to be the most common facility available to the population in all zones except the Eastern and Southern. These two zones also stand out as having the largest percentage of people without a sanitary facility of any kind. This is a rather serious problem, as in this case, it is most likely that the open air is used for purposes of defecation and this gives rise to numerous problems.

As the table shows, in Darfur, 16.33% of the population use "other" types of sanitary facilities, rather than 'none'. This presumably means it is a kind of sanitary facility, different from those listed above. It would be interesting to know what this "other" is since it is quite popular. Maybe this question could be addressed in the new questionnaire.