THE 1996 MULTIPLE INDICATOR CLUSTER SURVEY:

A SURVEY TO ASSESS THE SITUATION OF FAMILIES IN IRAQ

FINAL REPORT

WITH RESULTS FROM NORTHERN GOVERNORATES

UNICEF, Iraq
May, 1997

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Office of the Representative مكتب الممثل

United Nations Children's Fund
Founds des Nations Unies Pour l'enfance
Fondo de las Naciones Unidas Para la Infancia

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Subject: **The 1996 Multiple Indicator Cluster Survey : A Survey to Assess the Situation of Families in Iraq.**
Final Report with Results from Northern Governorates

UNICEF Iraq is happy to share a copy of the above Report which is based on prior submissions from consultants (international and local), inputs by key UNICEF staff, and Central Statistical Organization staff (for methods).

The results are limited to the Northern Governorates as data and information for the South/Central areas of Iraq have not yet been released.

The report confirm the continuous serious nutritional situation in young children in Northern Iraq. At any one time about 20,000 children are wasted and 130,000 children under five years of age are chronically malnourished.

One-half of the households (54%) only have both adequate water and sanitation access. 64% of mothers are illiterate. Less than half (40%) of rural older girls are attending school. Immunization coverage is very high for BCG (96%), and intermediate for DPT3/OPV3 (72%) and measles (79%).

There is a lack of adequate practices by mothers for proper care of the two major infections in these young children - acute respiratory and diarrhoea. Adequate breast feeding practices (exclusively) in young infants occurs in about one-half of mothers and bottle feeding is used for about one-third. This suppresses breast-feeding and greatly increases the hazards of contamination with deadly organisms.

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بغداد - العراق

About one-half of children received at least one Vitamin A dose and almost three quarters of all households had adequate iodine in their salt. About two-third (65%) of all mothers reported that their last delivery was at home.

Rural prevalence rates are worse than urban for several indicators, e.g. water access (35 vs 95%), mother's literacy (18 vs 45%) and receipt of Vitamin A (18 vs 48% for children under 2).

The comparisons by sex show that less than half (40%) of the girls aged 12-14 years in rural area attended school compared with two-thirds (67%) of boys. The disparity widens at 13 years (girls vs boys - 26 vs 61%) and at 14 years (13% vs 66%).

The comparisons by Governorates show that access to water is lower in Sulaimaniyah (59%) than with the other Governorates (92-93%). The same applies for safe sanitation which has Sulainaniyah lower than Dohuk (58 vs 87%), but Erbil is the lowest (40%), despite a high safe water access rate. It may be useful to compare the MICS results with aggregate results from the mapping exercise. Vitamin A supplement appear much less in Sulaimaniyah compared with the other Governorate (19 vs 44-57%) and iodized salt rate in Dohuk is the lowest.

All the above findings and analysis have programmatic implication in the implementation of both SCR 986 and on-going programmes assisted by UNICEF and other Government/non-government/UN agencies.

Therefore this report should be shared as widely as possible to complement our knowledge and improve the situation of families in the three Northern Governorates.

Another report on the Nutritional Status Survey at Primary Health Care Centers conducted by the Ministry of Health (GOI), UNICEF and WFP during the Polio National Immunization Day (PNID) in the 15 South/Center Governorates will be distributed in the next few days.

Best regards.

DISTRIBUTION LIST OF THE 1996 MICS (NOTHERN IRAQ)

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PREFACE

This report is based on prior submissions of consultants (international and local) and input by key UNICEF staff (Planning, Program, Health, Water/sanitation and Education) and Central Statistics Organization staff (for methods).

Results are limited to the Northern Governorates as data and information for the South/Central areas of Iraq have not yet been released.

ACKNOWLEDGMENTS

The 1996 Multiple Indicator Cluster Survey (MICS) in Iraq was developed and supervised by the Mother and Child Unit of the Central Statistical Organization (CSO), Baghdad, with support from UNICEF/Iraq.

Personnel from the CSO with direct survey involvement included the following:

Adnan Shihab (Director, CSO) - responsible officer for the survey in the south/centre; Abdullah Hassan Mathi (Head, Mother and Child Unit - MCU) and Nabil Zeki (former Head) - implementation in the south/centre; Munther Abbas, Siham Abdul Hamid and Huda Heddawi (MCU) - planning and implementation in the south/centre: and Bushra Abdul Jawad (Computing and Data Analysis Unit), who supervised data entry and analysis for the south/centre. Directors of CSO Governorate Offices were supervisors.

The Nutrition Research Institute, MOH conducted training on anthropometric measurements.

Staff from UNICEF included:

Basil Al-Hussaini (Planning Officer, Baghdad)- responsible officer for the survey; Ashwaq Wardi (Health Officer, Dohuk) - sampling and implementation in the north; and Baath Al-Badri (Planning Office, Baghdad) - report typing. Nefise Bazoglu (Monitoring and Evaluation Officer, MENARO) who contributed to the analysis. Others in UNICEF contributed to the final report.

International consultants hired by UNICEF included:

Caesar Victora (Federal University of Pelotas in Brazil) - sampling; Patricia David (Harvard School of Public Health, Boston, USA) - preparation, questionnaire, training, data entry, analysis and reporting; Anwar Batieha (Jordan University of Science and Technology, Irbid, Jordan) - field work in centre/south; Mahir Ulusoy (Haceteppe University, Ankara, Turkey) - analysis; Kevin Sullivan (Emery University, Atlanta, USA) - analysis with special reference to the anthropometry for all regions and training for EPI Info; and Alfred Zerfas (consultant for SCR986) - analysis and reporting.

Local consultants hired by UNICEF included:

Medhi Al-Ani (initially Director of the Department of Household Surveys, CSO) - preparation and sampling; and Tariq Ziad (computing) - data entry and preliminary analysis for the north.

ACRONYMS

ARI	Acute Respiratory Infection
BCG	Vaccine used against Tuberculosis in young children
CSO	Central Statistical Organization
DPT	Diphtheria/Pertussis (Whooping Cough) /Tetanus combination vaccine
EPI	Expanded Programme on Immunization
MCU	Mother and Child Unit
MDG	Mid-Decade Goals - Goals to be achieved by the end of 1995, using selected indicators
MENA	Middle East and North Africa UNICEF Office in New York HQ
MENARO	Middle East and North Africa UNICEF Regional Office in Amman
MICS	Multiple Indicator Cluster Survey
OPV	Oral Polio vaccine drops for young children
ORS	Oral Rehydration Solution
ppm	Parts per Million - a measure of Iodine content in salt
PPS	Probability proportional to size; chance for selection is according to its size
SE	Standard Error - a measure of variability for a sample estimate, such as a proportion
TT	Tetanus Toxoid - Vaccine for women to prevent tetanus mainly in their forthcoming children
UNICEF	United Nations Children's Fund

GLOSSARY

Breastfeeding - Exclusive	No addition to breast milk- eg water, fluids nor foods - essential in the first 4 months of life
Census blocks	Defined geographic areas during the census, the last in Iraq was in 1987
Child Summit Goals	Goals (using selected indicators) set for 2000 at the World Summit for Children
Cluster	The group of households identified in the final stage of the sample. The cluster location is termed a sample site.
Current status	Description of events as occurring now (more accurate than recall, trade-off is lower sample size)
Design effects	The effect that clusters have on sample size needs
EpiInfo	A software package for data entry and analysis
Fresh foods	Any solid or semi-solid food
Governorates	The major administrative areas of Iraq
Indicator	A measure of the topic of interest (eg Low height-for-age reflects chronic malnutrition)
Malhalla	Neighbourhood in an urban area
Malnutrition	Inadequate (or imbalance) of required nutrients/calories due to lack of feeding, absorption /utilization (eg during illness) or increased need (during growth). Caused by lack of food, health and care.
Malnutrition-acute	Body measure (low weight-for-height) reflects recent onset malnutrition (wasting)
Malnutrition-chronic	Body measure (low height-for-age) reflects long-standing malnutrition (stunting)
Malnutrition-general	Body measure (low weight-for-age) - combined recent/long-standing malnutrition
North Governorates	Three Governorates comprising Erbil, Sulamaniyah and Dohuk
Prevalence	The number of events or cases at one time (percent prevalence is number of cases of every hundred total; e.g. prevalence of acute malnutrition is 100 out of 1000 or 10%)
Probability sample	A sample where the probability of selection of any household is known
Random	By chance; there is no predetermination for selecting a particular household
Recall	Description of events in the past
Rural Stratum	Division of a population into rural areas
Salt Iodization	Iodide added to salt. Recommended is at least 30-50 parts per million
Sampling	The selection of part of a population from the whole (the latter being a census)
First stage	The first major population groups from which a sample is to be selected (eg for urban a listing of all cities and towns)
Second stage	The second population groups selected within the first stage (eg for urban all neighbourhoods in the selected cities or towns)
Third stage	The third population groups selected within the second stage (eg for urban four segments within the selected neighbourhood - one of these will be sampled)
Site	The location of a cluster
South/Central Iraq	Fifteen Governorates, comprising the major part of Iraq with Baghdad as the Capital
Stratum	Division of a population into a sub-group
Urban Stratum	Division of a population into urban areas
Vaccination	Provision of a substance which stimulates or replaces the antibodies to prevent an infection - also termed immunization
Vitamin A	An essential vitamin to maintain proper lining cells throughout the body and provide adequate vision
Weighting	The adjustment made in the analysis for unequal sampling probabilities

THE 1996 IRAQ MULTIPLE INDICATOR CLUSTER SURVEY

Summary

The 1996 Multiple Indicator Cluster Survey (MICS) describes the extent of selected key problems and interventions throughout all of Iraq and provide this information to policy-makers, planners and implementors in a timely manner. It will also provide baseline data against which the impact of the implementation of Security Council Resolution 986 (Food for Oil) can be assessed. The survey was conducted by the Central Statistics Organization (CSO) principally the Mother/Child Unit (MCU), Government of Iraq with UNICEF collaboration.

The indicators selected were those pertaining to health, nutrition, water/sanitation and education. The statistically valid sample has 342 clusters and 8,550 house-holds with 8,191 children under five years of age. Each cluster averages 25 households. The design is multistage and stratified by urban/rural. Descriptions are possible by governorate, urban/rural and male/female.

This report describes the planning and methods used for the whole of Iraq. However, results include only the Northern Region. These confirm the continuing serious nutritional situation in young children. About one quarter (26%) are chronically malnourished, with children aged from 6 to 24 months at highest risk. However there is no major recent acute deterioration, based on relatively low levels of acute malnutrition (4%). There is evidence that malnutrition has reduced since the December 1993 survey in the Northern Governorates. Even so, at any one time about 20,000 are wasted and 130,000 children under five years of age are chronically malnourished.

Approximately three-quarters (77%) of the households have access to a "safe" water supply and about one-half (58%) have access to "safe" sanitation, although water quality and quantity are unknown. Further, about 20% have no adequate access to both safe water and sanitation.

More than three-quarters (81%) of 6-11 year olds attended school during the 1995-6 school year with slightly less for those aged 12-14 years. However, less than half of rural older girls attended school. About one-third (36%) of mothers are literate, much less in rural areas compared to urban (18 vs 45%).

Immunization coverage for children have adequate reported levels, ranging from three-

quarters for diphtheria/polio/tetanus (DPT3), to 79% for measles to almost all (96%) for BCG. Two-thirds of mothers (67%) had at least two doses of tetanus toxoid prior to or during their last pregnancy.

There was a lack of adequate practices by mothers for proper care of the two major infections in their young children - acute respiratory and diarrhoea. Only one-third could recognize either of the two major warning signs for serious respiratory infections (rapid or difficult breathing). About one-half of the mothers (54%) provided adequate fluids for diarrhoea and only one-third (37%) provided adequate feeding.

Although almost all mothers ever breastfed their child, about 70% continued this practice during the first year, reducing to 47% early in the second year and to 17% by the end of the second year. However, adequate breast feeding practices (exclusivity) in young infants occurs in about one-half of mothers. And the bottle is used for about one-third. This suppresses breastfeeding and greatly increases the hazards of contamination with deadly organisms. Feeding of solid or semi-solid foods during 6-9 months of age is low - only in one-third. These foods are essential to complement breast feeding and ensure adequate growth and health of the young child.

Concerning micro-nutrients, about one-half of children had received at least one Vitamin A dose and almost three-quarters of all households had adequate iodine in their salt.

The prevalence of malnutrition at moderate/severe levels is compared according to access to safe water and to safe sanitation, place of last child birth, number of household members, birth interval for last two children and education of the mother. There is no marked difference in malnutrition rates for water access, some for sanitation access and major differences for place of child birth and education of the mother. Household size shows a curious trend - medium sized households (5-7 members) appear to have less malnutrition rates than smaller or larger sized. Birth intervals show differences between those under 24 and 24-35 months compared with over 36 months. Targeting would seem to be appropriate for mother's education level and her child's birth place, factors which influence variation in nutritional status within urban/rural settings and governorates.

THE 1996 IRAQ MULTIPLE INDICATOR CLUSTER SURVEY

Introduction

The 1996 Multiple Indicator Cluster Survey (MICS) is part of a reiterative process designed to gather data on selected key problems and interventions throughout all of Iraq and provide this information to policy-makers, planners and implementors in a timely manner. It will also provide baseline data against which the impact of the implementation of Security Council Resolution 986 (Food for Oil) can be assessed. The survey was conducted by the Central Statistics Organization (CSO) principally the Mother/Child Unit (MCU), Government of Iraq with UNICEF collaboration.

This survey covered a wide range of topics relevant to mothers and children with a sufficient sample size to describe each Governorate as well as the total country. It was the only national health and nutrition survey since the onset of the sanctions, apart from that done in 1991 by an International Team[1].

The indicators selected were those pertaining to health, nutrition, water/sanitation and education. These are relevant to the Ministry of Health, Ministry of Interior (Water/Sanitation) and Ministry of Education. The health/nutrition indicators for children aged under five years included nutritional status, breast and infant feeding, immunization coverage, diarrhoea and practices, receipt of Vitamin A supplement, and mothers' knowledge of acute respiratory infection severity. Household information related to safe water/sanitation access and use of iodized salt. School-age indicators derived entry, net and gross enrolment rates. The survey also determined indicators for safe motherhood (place and attendance at delivery, tetanus toxoid), mothers' education and work status.

Sampling

The statistically valid sample had 8550 households, with 425 households in each of the 15 governorates in South/Central Iraq (total of 6375 HH) and 725 households in each of the three Northern governorates (total of 2175 HH). The design was multistage and stratified by urban/rural[2]. (see Annex I for more details).

[1] The 1991 survey (Health and Welfare after the Gulf Crisis, October 1991, Harvard University, Mimeo), covered health, education and nutrition indicators, but the sample was insufficient for governorate descriptions. Surveys of Northern Governorates which included nutrition status, have been done (e.g. in 1993 and 1994, supported by UNICEF).

[2] Weighting of the results is needed to adjust for the different sampling probabilities by urban and rural within each governorate.

A total of 342 clusters were randomly selected through multi-stage sampling. In South/Central Iraq, with 17 clusters per Governorate (12 in urban and 5 in rural) and in the North 29 clusters per Governorate (17 in urban and 12 in rural). It was felt especially important to derive precise governorate-level information because of its unstable situation the. Each cluster had on average 25 households.

The South/Central sample was a sub-sample of the 1993 Household Survey (conducted by CSO) . and the North based on the 1995 census in that region. Sampling design differed between the South/Central and the North. In the South/Central, clusters were randomly selected in the second stage (i.e. within urban blocks or villages); in the North clusters required an added stage to identify segments of 25 households, with each household identified on sketch maps drawn by field staff.

Table 1. Basic information for sampling

Estimate for 1994 *	Urban	Rural	Total
Total population	14,308,400	5,698,600	20,007,000
Population proportion	71.5%	28.5%	100.0%
Average household (HH) size**	7.6	9.2	8.1
Number of households	1,882,684	619,413	2,502,097
Average number of children under 5 years/HH			1
Estimated number of U5's/cluster			25
Sample size required for U5's			400

** CSO projections based on 1987 Census of Iraq. **1993 Household Socio-economic survey of South-Central Iraq*

Population estimates and required number of children aged under 5 years per description by area are shown in Table 1. In this example in order to achieve the required sampling accuracy approximately 400 children were needed[3]. This would allow descriptions of each governorate, but not separate urban/rural within governorates. Criteria for narrower age ranges with less numbers of children (such as immunization of children aged 12-23 months) were more stringent.

[3] Sampling accuracy (confidence interval) describes the degree that an estimate (such as percent prevalence) lies within a certain range, based on the sample. For example, if an estimate of undernutrition is 25%, it lies between 20 and 30%, with a 95% confidence interval of +/- 5%.

Methods

The methods and questions in this survey followed the format recommended by UNICEF (Monitoring progress toward the goals of the World Summit for Children: A practical handbook for multiple indicator surveys, January 1995)[4] - see Annex II for more details. The questions developed for the trial MICS 1995 survey[5] were modified according to the handbook specifications after field testing in Baghdad and Babylon, then translated into Arabic and back-translated to English for checking. Child age was determined from birth certificates essential for obtaining ration cards.

Two training sessions during July (each of three days) were conducted at CSO, Baghdad for a total of 90 CSO and MOH field staff. A further day's training occurred later in Hilla, Basra, Baghdad and Tikrit with special emphasis on anthropometric measures. A field guide translated into Arabic was developed, but no standardization exercises done[6]. Following training, a one-day pilot survey was conducted in each governorate by field teams in a cluster not included in the survey sample.

Data collection took 24 days (August 10 to September 5) in the South/Centre and initially in the North. However, fighting in the North caused a temporary suspension of fieldwork. This was completed in Erbil on September 19 in Suleimanayah on September 30. People were very co-operative, and no refusals occurred. However, in 10 villages in the North, some villagers move to temporary tents near their fields located near their original villages, which made them harder to locate and reach.

Clusters usually took two days to complete, with an average interview of 30 minutes. Most clusters were within an hour's drive of the governorate capital, except in the Northern region and in the South-central governorate of Anbar. The teams returned to the capital for their mid-day rest, revisiting the cluster late in the afternoon. In more distant clusters, teams took their lunch at a restaurant in the area, but returned to the governorate headquarters at night. In a few clusters, they stayed overnight to complete the second day of interviewing.

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[4] A notable omission was mortality of young children.

[5] A previous Multiple Indicator Cluster Survey (without nutritional status) was conducted in Iraq in 1995 with advice from a team of statisticians from Bangladesh. The Central Statistics Organization considered this experimental and no results were released.

[6] Anthropometric equipment were the same as those provided by UNICEF to governorate Primary Health Care departments. The "Uniscale" weighed children. First the mother is weighed, then the mother and her child are weighed, revealing child's weight automatically. Imported measuring boards of standard manufacture were used to measure length for children up to 23 months of age and height for older children

Each governorate had two survey teams, composed of two CSO interviewers and a Ministry of Health representative[7]. At least one member of each team was female. Governorate CSO directors acted as field supervisors (one per governorate). They traveled each day with a different team, checked forms for errors and re-interviewed at least one selected household per cluster. At times interviewers needed to return to households to collect the required information. If errors or omissions were not detected until the questionnaire was being processed in Baghdad, the relevant query was transmitted to the Governorate CSO director by telephone.

MCU staff of the CSO traveled to each governorate during data collection to provide a further check on data coming in to the governorate office. A "hotline" for problems and questions was also maintained at CSO headquarters in Baghdad by MCU members. An external consultant visited Iraq during field work to help with field supervision (accompanied by UNICEF staff), focusing on quality control issues, and assuring adherence to the agreed upon protocols.

Following the completion of field work, the UNICEF/Baghdad Planning Officer, responsible for the survey and senior staff (in the North this included the UNICEF Health Officer/Dohuk) with the respective supervisors, checked all forms. In a few clusters (e.g. in Erbil governorate) interviewers were asked to go back and collect more information.

For data entry, CSO staff used FoxPro programming. Although each section of the questionnaire had different modules (e.g. for water/sanitation, school attendance, diarrhoea, etc), unique sequenced numbers were developed for each household, mother and child, allowing later module combinations. Range, consistency checks and preliminary analysis allowed problems to be reported to governorate supervisors. In some cases return visits to households were made to correct these.

For the North, a local private firm in Baghdad, entered data using EpiInfo, Version 6. The firm also provided CSO staff with basic training for the nutrition analysis program using EpiInfo and converted the CSO raw survey data file for analysis of nutritional status.

Analysis was done in stages. Initially for the South-Central region, this was done by the Central Statistical Organization with UNICEF participation. Later, after training in EpiInfo, analysis continued with revised programmes, including conversions for the nutritional status indicators, cluster analysis and weighting. Final analysis for the South/Central (at CSO) and the North (at UNICEF) was done separately, with some attempts to standardize procedures.

[7]Each team member received a lunch stipend of 1000 dinars/day (around $1 US at the time)

RESULTS FOR NORTHERN GOVERNORATES

Results are presented for each area of concern first for the total sample in the North, followed by urban/rural and male/ female and between governorate comparisons. A summary table is at the end of this section, followed by graphs for each group. Finally, an extended table provides more detailed information, including confidence intervals (where appropriate) and sample sizes.

1. Malnutrition

Chronic malnutrition occurs in about one-quarter (26%) of children under five years of age in the Northern Governorates (Dohuk, Suleimanayah and Erbil) of Iraq and underweight in about one-in-five. The present underweight estimate of 19% is about twice that of Jordan and Turkey (9-10%) and slightly more than Iran (16%[8]).

Although the nutrition problem remains serious, the prevalence of acute malnutrition (4%) is low enough to suggest there is no major recent acute deterioration at the time of the survey, which would be reflected by levels approaching or over 10%. However, this does not exclude population pockets within the region with high levels of acute malnutrition.

Based on these results and with an estimated population of 500,000 children under five years of age, it is likely that the following numbers of children under five years are malnourished according to anthropometric criteria:

Table 2. Estimated numbers of malnourished children - Northern Governorates MICS, 1996

Malnutrition type	Indicator	Total < -2SD*	Moderate <-2 to -3 SD	Severe < -3SD
General (Underweight)	Weight-for-Age	95,000	70,000	25,000
Chronic (Stunting)	Height-for-Age	130,000	85,000	45,000
Acute (Wasting)	Weight-for-Height	20,000	17,500	2,500

**Between -2SD (standard deviations) and -3SD represents moderate and less than - 3SD severe.*
(See box next page for explanation)

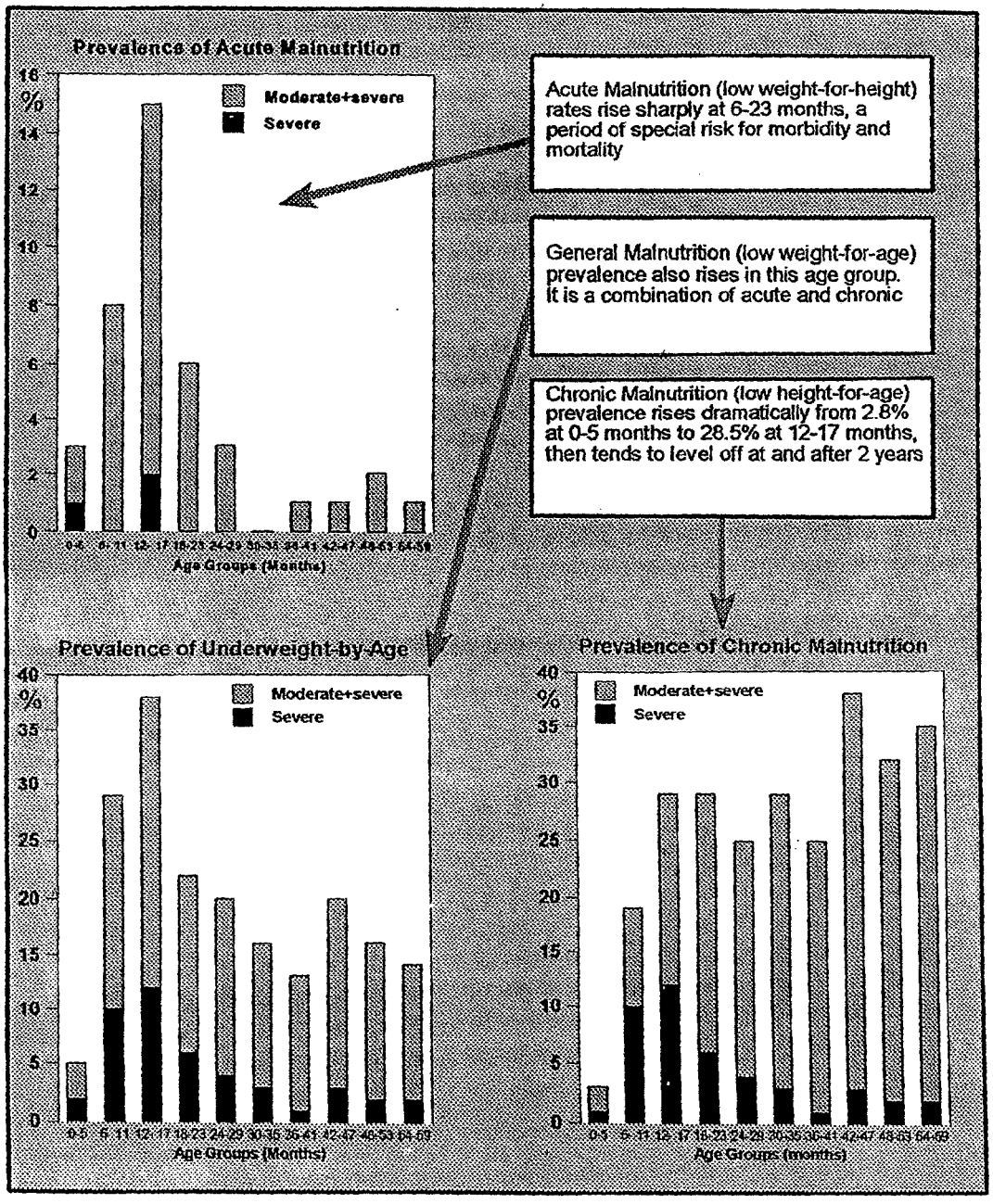
The numbers used for planned screening depend on the anthropometric criteria. In the Northern governorates this is based on low weight-for-height (wasting). Hence about 20,000 children would be expected to have this problem at any one time. Over a period of time (each month or two) some of the wasted children would improve and some not[9]; and additional

[8] All country rates for these and other indicators are quoted from The State of the World's Children, 1996 or The Progress of Nations, 1996

[9] After two years of age the prevalence of wasting reduces greatly

Figure 1: Malnutrition by Age

By Age Groups - Northern Governorates



numbers would be added to those wasted. Because the estimate for chronic malnutrition indicates a cumulative result, this can be used for a crude estimate for over a period of time, such as one year. However, we do not know how many children who have or do not have the acute variety will evolve into the chronic.

Chronic malnutrition *(or stunting) results in poor physical child growth, often accompanied by sub-standard capacity for development and education. It reflects the cumulated insult on child growth by adverse economic conditions, poor health, feeding and care. Chronic malnutrition is difficult to reverse after the child reaches 2-3 years of age. Often stunted children grow up to be stunted adults, with a continuation of the same detrimental process on their children.*

Acute malnutrition *(or wasting) reflects more recent onset adversities, such as diarrhoea and acute respiratory infections compounded by inadequate feeding. It is most easily reversed, but often recurs due to repetition of this cycle. This type of malnutrition is the most readily recognized by mothers, due to a child appearing thin.*

Underweight *implies a composite of chronic and acute malnutrition - either or both of these can result in underweight. It is the most widely understood indicator for nutritional status and is used in the Progress of Nations by UNICEF to monitor nutrition.*

Whereas chronic malnutrition and underweight are measured by a low height and weight for age respectively, acute undernutrition is assessed by a low weight for height.

The pattern of malnutrition by age shows the critical age at risk are those under two years. Levels of acute malnutrition for children aged 6-23 months are at least five times greater than those aged 24-59 months[10] (Figure 1). The prevalence of chronic malnutrition is low (3%) for children aged 0-5 months (primarily protected by breast feeding), rises to 19% at 6-11 months of age and reaches a peak of 30-35% from 12-17 months to 54-59 months. This indicator cumulates as the child ages, hence the process of stunting up to two years of age is more important than the extent at later ages.

There is evidence that the prevalence of chronic malnutrition has been reduced since the December 1993 survey, due to a number of factors perhaps including the intensive relief operations. This requires review of the prior data sets to determine the precise extent. Comparison of the results for the August 1991 survey by the International Team indicates there has been little overall change in prevalence rates since that time (stunting 29.5 vs 26.3%; underweight 19.1 vs 19.3%; wasting 4.5 vs 4.8% - 1991 results listed first). However, fluctuations of these rates may have occurred between 1991 and 1996.

[10]Sampling accuracy is less than that for children aged from 0-59 months (i.e. under 5's). However the patterns, not exact values describe the extent of the differences which sufficiently great to be of import.

Figure 2:

% Adequacy of Water and Sanitation Access

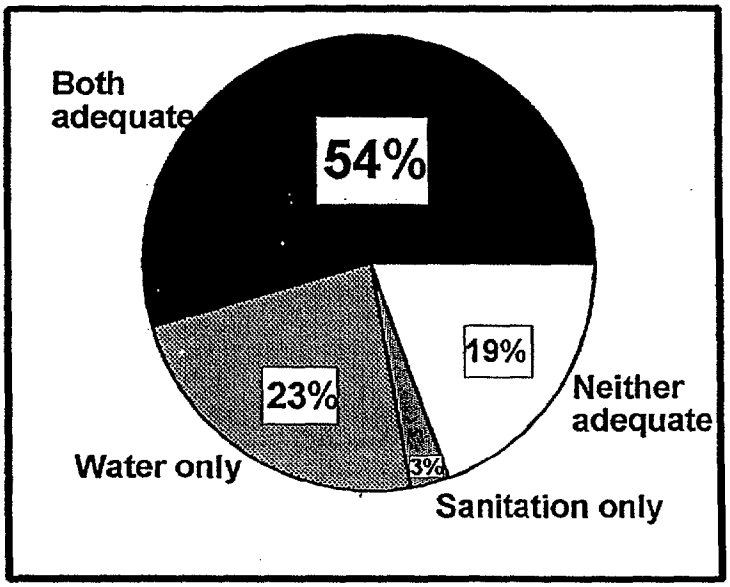
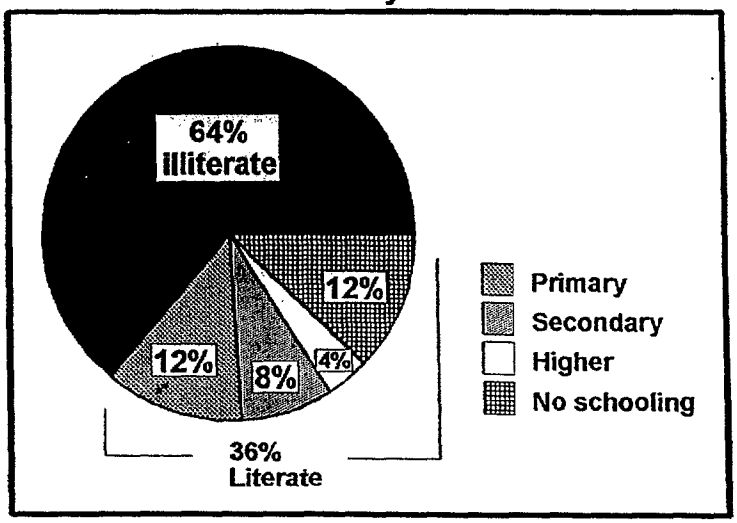


Figure 3:
Percent Literacy of the Mother



2. Water and Sanitation

Approximately three-quarters (77%) of the households surveyed have access to a safe water supply (from a network, public tap or well, inside the home or within 100 metres). Further, more than half of the households (58%) have access to safe sanitation (flush to sewage system or flush to septic tank and inside the home or within 50 metres). However, this does not take into account the quantity or quality of the water nor the appropriate means of controlling sewage. Further, information was obtained from direct questioning, there being no systematic inspection of facilities.

Just over one-half of the households (54%) had both adequate water and sanitation access, about one-quarter (23%) had access to water but not sanitation and most of the remainder (19%) had no adequate access to either (Figure 2)

3. School Attendance

More than four-of-five children (81%) aged 6-11 years had attended school during the 1995-6 school year (net enrollment rate[11]). Further almost the same percent (75%) of children aged six had attended school in that year (primary school entry rate). According to a senior survey supervisor, positive responses indicated regular attendance. The gross enrollment rate is 117 [12]. This reflects the proportion of older children who lag behind in education (denoted by a result over 100), but is difficult to interpret. A more direct assessment is the percent of children aged 12-14 who attended school, which was 68%.

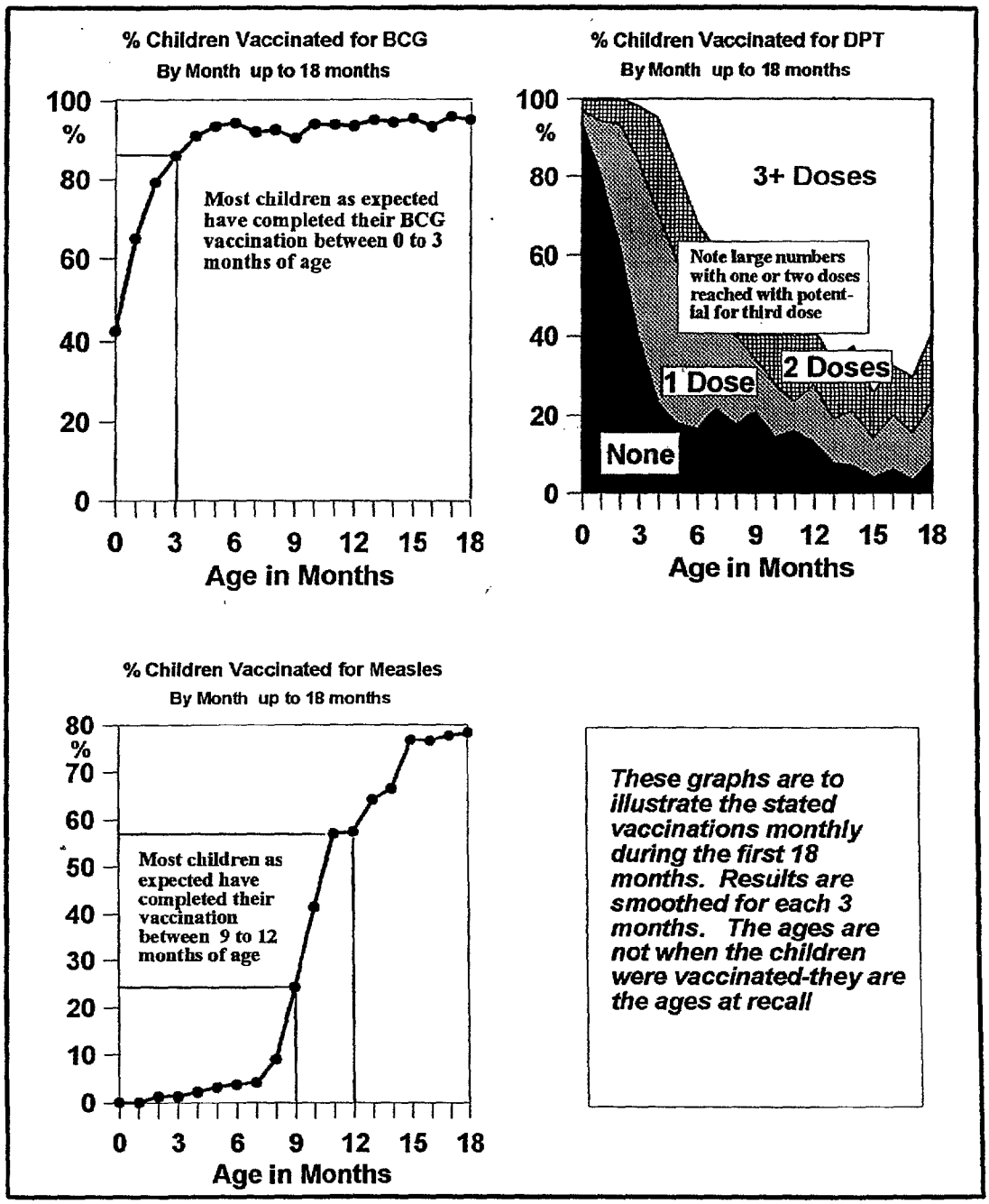
4. Education of Mother

About one-third (36%) of mothers with at least one child under 5 years of age, is literate (either read and write or attended school). The result of 36% compares with rates for Iran (52%), Turkey (69%) and Jordan (73%) all based on 1990 data. The survey question combined literacy with prior school attendance, with the following results - illiterate (neither read nor write) 64%. Of the 36% literate, those without formal education - 12%, primary education - 12%, secondary education - 8%, diploma/degree - 4% (Figure 3). Education has important relationships with nutritional status. A child whose mother is illiterate is much more likely to be malnourished than a child with a literate mother. Underweight prevalence for children of illiterate mothers is 22%; of mothers with primary school attendance 16% and of those with higher education 10%. (see pp 49-52 for details).

[11]The definitions for net and gross enrollment rates in this survey, although following those designated by the MICS handbook, may not be the same as indicated by other agencies (see Annex 3 for definitions).

[12]Gross enrollment rate - the ratio of the number of 6-15 year olds attending primary school divided by the total number of children aged 6-11 years

Figure 4:
Vaccinations by Age of Recall



5. Immunization

Immunization coverage for children aged 12-23 months is very high for BCG (96%) and intermediate for DPT3/OPV3 (72%) and measles (79%). Mothers were questioned about immunizations but it is unclear how often the information on the child health card was examined at the time of the interview. According to a senior survey supervisor, almost all children who were immunized had a health card, assiduously kept by the mother.

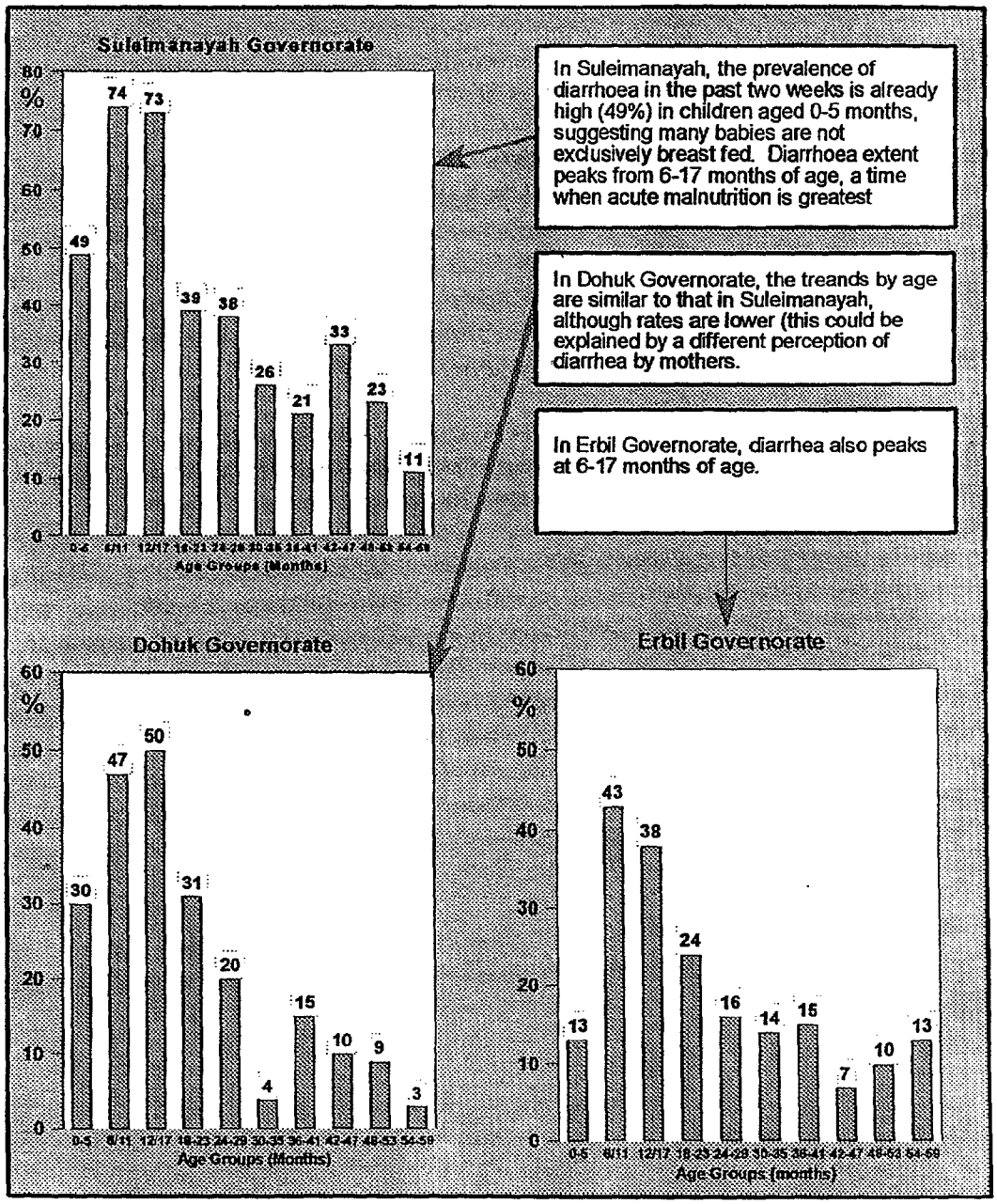
The lower immunization rates for DPT3/OPV3, as compared with measles, an unusual result, needs explaining. Mothers may have been confused by the recent introduction of polio vaccine combined with BCG at birth. However, it is of interest that over 75% of mothers of children aged up to 18 months indicated that their child received polio with BCG. On the other hand, no mothers of children aged two years and above reported this combination. The coverage rate for polio is probably an under-estimate as the results for OPV3 were identical to that of DPT3; hence specific reference to the polio campaign appears to be missing.

There was no check as to the potency of the measles vaccine, for example no questions asked about the occurrence of measles. However, prior studies by the MOH have shown good maintenance of the cold chain for measles vaccination.

The decade goals specify that vaccinations should be completed by specific age ranges (e.g. by 12-23 months). However, it is useful to consider the ages children were vaccinated. Mothers were asked whether their child received the vaccinations at any time previously, without indicating the age this was done. However, indirect inferences are possible in that a positive response indicates the child must have received the vaccination before the current age. Most children have completed their BCG vaccinations by 3 months of age (Figure 4). By the start of their second year, almost all children reportedly received at least one dose or two doses of DPT, with about 70% with at least three doses. For measles, although most of the children vaccinated for measles received this by 12 months of age, there may be significant additional numbers receiving this in their second year.

Two-thirds (67%) of the mothers had received at least two doses of tetanus toxoid immunization prior to or during their last pregnancy and almost one-half (42%) during their last pregnancy.

Figure 7: Recent Diarrhoea by Governorate and Age



6. Acute Respiratory Infections (ARI)

Mothers of an under-five year old child were asked "when your child is ill with cough and/or cold, what signs or symptoms would lead you to take him/her to a health unit or doctor?". Mothers' responses (at times multiple) were as follows, results ranging from the most to least frequent: High fever (70%) difficulty breathing (36%), cough for more than 2 weeks (22%), trouble eating (23%), trouble sleeping (19%), rapid breathing (3%); as well as other (26%) and don't know (13%)- Fig. 5.

The definition of appropriate intent is difficult or rapid breathing, which amounted to about one-third (37%) of all cases. For some reason mothers are more familiar with difficult than rapid breathing, although the distinction may not be obvious to them. Responses were very similar in all age groups. However, interpretation is not very clear and the prevalence of ARI was not determined.

Figure 5

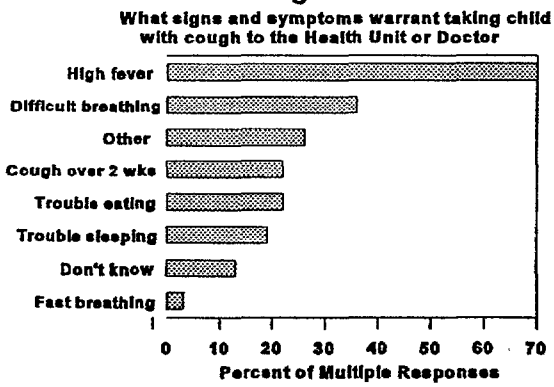
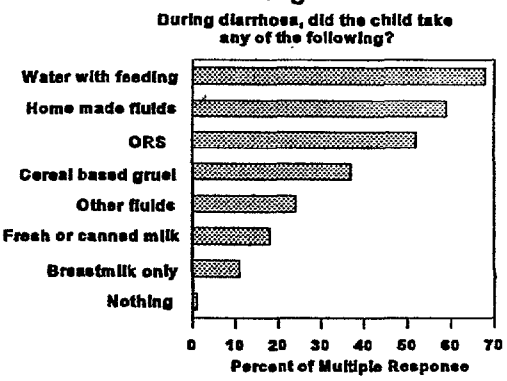


Figure6



7. Diarrhoea - Oral Rehydration and Feeding

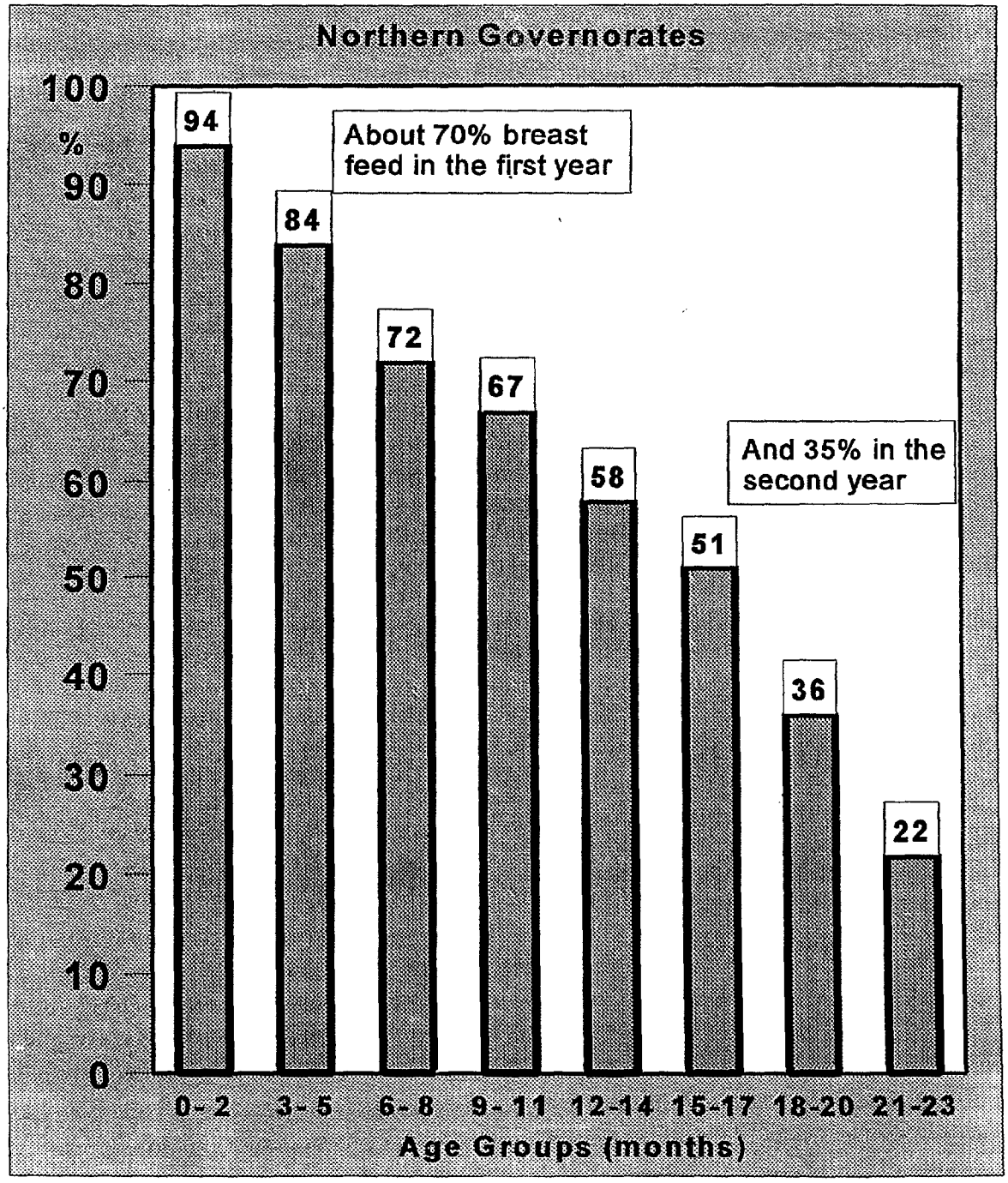
Over one-quarter (28%) of all children aged under five years had diarrhoea during the prior two weeks with an additional 10% up to the past month. Mothers were asked "During diarrhoea, did the child take any of the following fluids?" Responses (at times multiple) were according to preselected codes as follows: water with feeding (67%), home made fluids (59%), dextrolite or ORS (43%), cereal-based gruel (37%), fresh or canned milk (23%), water only (22%), other fluids (19%), breast milk only (13%), and nothing (1%).- see Figure 6 The appropriate fluid management includes any of the first four responses, which totals 54%. Interestingly, the low figure for breast milk only occurs in infants as well as older children.

The appropriate fluid/food management requires two added questions (with responses again according to preselected codes) "How much of these fluids did you give your child?" and "During diarrhoea, did you give your child a quantity of food?". Acceptable responses (more fluid than usual; and less than, usual or more than usual food) occurred in about one-third (37%) of mothers.

The prevalence of diarrhoea in each governorate was much higher in children aged 6-17 months (ranging from 40 to 73%) as compared with other age groups (Figure 7 on page opposite). This is consistent with the findings of higher rates of acute malnutrition in the 6-17 month olds. Further, the prevalence of diarrhoea for the whole region in children aged 0-5 months was 30%, which indicates inappropriate breastfeeding practices and bottle use.

Figure 8:

% Prevalence of Current Breast Feeding by Age



8. Breastfeeding

Ever breastfeeding in infants is almost universal (99%) with an average of 70% during the first year , reducing to about one-half in children aged 12-15 months and to one-quarter in those aged 20-23 months[13] -Figure 7. Hence only one-quarter of mothers breastfeed their child to the end of the second year[14].

Exclusive breastfeeding (no added food nor fluid, including water) occurred in over half the infants (52%) aged up to four months[15]. This is based on the question relating to what was given to the child in the past 24 hours for those still breastfeeding, involving multiple answers. Hence the total sample size for those age up to four months was small (n=98), which does not give a precise result. The question on recall ("the period during which the child depended on exclusive breastfeeding without taking any other thing") has a much larger sample size, but responses clustered at certain ages and results appear unreliable. Further, mothers often had difficulty answering this question. Even so, these results are well below the aim for all women to breastfeed in this optimal way early in the life of their child.

Added foods: One-third (33%) of children aged 6-9 months received complementary (solid/mushy) foods. This is well below the level of 100% required for adequacy even not taking into account the quality, amount and frequency of such feeding. Again, results are based on the past 24 hours and not on recall because of clustering of response to certain age groups, such as six months.

Bottle feeding: A disturbing result was the high prevalence of bottle feeding in infants, (29%) for their first year. Bottle feeding occurs in almost all non-breast fed infants in the first 2 months of life and about one-half of these by the end of their first year - Figure 8. Bottle feeding is also common in breast fed infants, with an average of up to 20% in the first year. This suppresses breastfeeding and greatly increases the hazards of contamination with deadly organisms. How much of the bottle feeding can be attributed to feeding programmes is unclear.

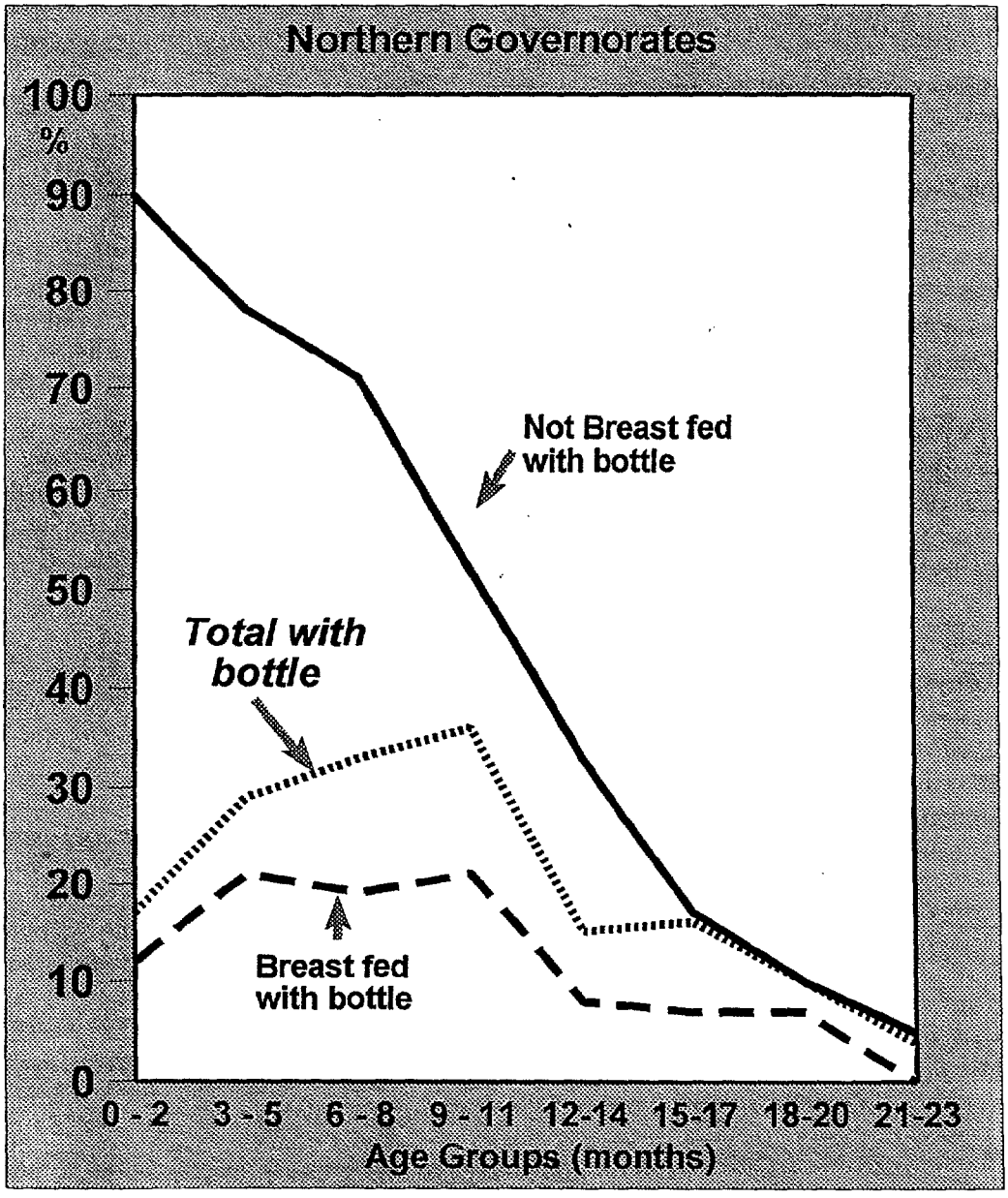
[13]Because of the narrow age ranges for breastfeedng at 12-15 and 20-23 months; and added foods at 6-9 months, estimates are relatively imprecise (+/- 10%). Also, no acceptable data are available for urban/rural, by sex and for each Governorate, due to low sample sizes

[14]Result for Jordan for 20-23 months is 13%; no data available for Turkey and Iran

[15]Result for Jordan for exclusive feeding is 32%; no data available for Turkey and Iran. The analysis for this indicator was based on the past 24 hours.

Figure 9:

% Prevalence of Bottle Feeding by Age



9. Vitamin A supplementation

About one-third (37%) of children under 2 years of age and one-half (51%) of those aged 2-5 years had received at least one Vitamin A dose. According to a senior survey supervisor, this is probably an underestimate. Adequate documentation for the mother of Vitamin A provision is lacking; further she is often not told what the child has received. For example, the drops for Vitamin A given for younger children may have been confused with polio drops. Appropriate supplementation has been planned at nine months of age (with measles vaccination) and again at 18 months. A single dose in insufficient, although the programme may not have had sufficient time to develop fully.

10. Iodized Salt

Almost three-quarters of all households had at least 25ppm of iodine in their salt as per the testing kit, a result which approaches acceptability. This level was chosen as surveyors found it difficult to distinguish levels of 50ppm or greater. The testing was often closely checked by supervisors. All salt is imported from outside the North, either from other areas in Iraq, Turkey or Iran.

11. Mothers' place and attendance at delivery

About two-thirds (65%) of all mothers reported that their last delivery was at home and almost all the remainder at a Public Hospital. The most common attenders were midwives (35%) followed by TBA's (26%) - each usually at home. Health cadres (20%) and physicians (14%) usually attended in hospitals.

Results for birth spacing may be imprecise as the responses were based on specific time intervals (less than 12 months, 12-23, 24-35 and over 35 months). These showed that very few (2%) births occurred within 12 months, the remaining periods were almost equally common (e.g. about one-third each of the total responses).

12. Comparisons by Urban/rural and Sex For Northern Governorates

Urban/rural comparisons

Rural prevalence rates are worse than urban for many indicators. This is especially marked for safe water access (34 vs 95%) and safe sanitation (16 vs 75%); mother's literacy (18 vs 45%); receipt of Vitamin A (18 vs 48% for children aged under 2 years). Despite the large difference in literacy, school attendance gaps were less marked; net enrollment for 6-11 years (72 vs 86%) and school entry (70 vs 78%).

Relative immunization coverage varied. Whereas for BCG, results were high in both rural and urban (92 vs 98%), there is a 20% deficit for DPT3/OPV3 (59 vs 80%), slightly less for measles (69 vs 85%) and for tetanus toxoid in mothers (e.g. 61 vs 71% before and during pregnancy).

The prevalence of all types of malnutrition is greater in rural as compared with urban areas. This is by a factor of about five percent for chronic malnutrition (23 vs 17%) and underweight (30 vs 25%), and for acute malnutrition 5% compared with 3% for urban. However, none of these differences are statistically significant.

All other indicators have similar results for rural and urban areas. These include ARI knowledge, diarrhoea and appropriate fluid/food responses, breast and bottle feeding and iodized salt use.

Comparisons by Sex

The only important difference by sex for the indicators was in school attendance. Whereas that for children aged 6-11 has a marginal gap of girls to boys (76 vs 86%), the situation is much wider for older children in rural areas. Less than half (40%) of the girls aged 12-14 years in rural areas attended school compared with two-thirds (67%) of boys. The disparity widens at 13 years (girls vs boys - 26 vs 61%) and at 14 years (66% vs 13%).

13. Comparisons by Governorate[16]

The major differences are in water/sanitation, knowledge of ARI signs, diarrhoea and mothers' responses, Vitamin A supplementation and salt iodization. How much may be due to methodological reasons (different teams in each governorate) is difficult to assess.

Safe water access is much lower in Suleimanayah compared with the other governorates (59 vs 92-93%). Safe sanitation also has Suleimanayah lower than Dohuk (58 vs 87%), but Erbil is the lowest (40%), despite a high safe water access rate. Although the questions were standardized through the whole sample, the indicator relevance might be different by governorate. It may be useful to compare the MICS results with aggregated results from the mapping exercise.

Differences in ARI signs and diarrhoea indicators are quite marked and should be reviewed within the respective projects. Note that the estimates for ORT/fluids and

[16]Comparisons between governorates should be cautious, due to lower sample sizes as compared with the total sample. Further, comparisons of urban/rural or male/female within each Governorate is difficult to interpret, due to even greater sample size limitations

responses are quite imprecise due to lower sample sizes based on children under five years with current diarrhoea.

Vitamin A supplements appear much less in Suleimanayah compared with the other governorates (19 vs 44-57%). The much lower household iodized salt rate in Dohuk may be related to importation sources. Salt from Turkey may be less likely to be iodized than that from Iraq or Iran.

14. Relationships between nutritional status and key indicators

The prevalence of malnutrition - low weight-for age (general); weight-for-height (acute) and height-for-age (chronic) - at moderate/severe levels is compared according to the following:

1	Access to safe water:	Adequate or inadequate
2	Access to safe sanitation:	Adequate or inadequate
3	Place of last child birth:	Home or institution
4	Number of Household members:	1-4, 5-7 or 8+
5	Birth interval for last two children:	Under 24m, 24-35m, 36 months or more
6	Education of mother	Illiterate, primary and higher education

Results

There is no marked difference in malnutrition rates for water access, some for sanitation access (general and chronic) and major differences for place of child birth and education of the mother. (See Tables on pp 49-51). Household size shows a curious trend - medium sized households (5-7 members) appear to have less malnutrition rates than smaller or larger sized. Birth intervals show differences between those under 24 and 24-35 months compared with over 36 months. Targeting would seem to be appropriate for mother's education level and birth place - these are probably highly correlated. Note that such correlations rates do not necessarily imply a causal relationship. Further, differences for acute malnutrition are less likely to be evident due to low rates overall.

To explore these relationships further, results are stratified by education, governorate, urban/rural and age of the child. Increased malnutrition prevalence for inadequate water and sanitation access appears only in those households with a higher educated mother. In all situations, child malnutrition rates are greater in illiterate mothers and those who bore their last child at home, rather than in an institution.

Table 3:
Multiple Indicator Cluster Survey (MICS) - August 1996
Results for Northern Governorates (as % prevalence)

Indicators	TOTAL	Urban/Rural		Governorate			Sex	
		Urban	Rural	Dohuk	Suleim	Erbil	Male	Female
MALNUTRITION								
Underweight (mod/sev)	**19.3**	17.3	23.1	17.7	18.4	21.3	20.3	18.1
Chronic (mod/severe)	**26.3**	24.8	29.5	27.1	23.5	29.2	26.9	25.7
Acute (mod/severe)	**3.8**	3.4	4.8	4.1	4.3	3.0	4.3	3.4
WATER/SANITATION								
Safe Water Access	**77.1**	95.4	33.7	93.0	59.4	92.0		
Safe Sanitation	**57.7**	75.1	16.2	87.0	57.6	40.1		
EDUCATION								
School Net Enrol (6-11y	**81.4**	86.0	72.4	74.4	89.3	76.8	86.3	75.7
School Entry (6y)	**75.4**	78.0	69.9	62.8	84.7	71.3	78.0	72.4
School Gross Enl (6-15)	**111.3**	117.4	99.3	104.0	122.5	111.3	120.3	100.8
Mother's Literacy	**36.0**	44.7	17.7	34.8	37.3	35.2		
IMMUNIZATION								
BCG (12-23m)	**95.9**	98.2	91.8	95.9	96.5	95.0	96.1	95.7
DPT3 (12-23m)	**72.2**	79.6	59.0	73.0	70.5	74.0	72.6	72.7
OPV3 (12-23)	**72.2**	79.6	59.0	73.0	70.5	74.0	72.6	71.7
Measles (12-23m)	**79.1**	84.7	69.1	83.3	77.3	78.2	77.2	81.2
TetTox 2+ (all)	**67.3**	70.5	60.5	61.3	69.8	68.2		
TetTox 2+ (preg)	**42.4**	46.2	35.1	35.8	50.1	37.9		
ARI								
Know signs of ARI	**37.3**	35.0	42.3	17.5	46.1	37.3	37.3	37.3
ORT								
Diarrhoea (past 2w)	**27.8**	25.1	31.3	23.6	38.2	18.3	29.2	26.7
ORT/Fluids (2w)	**53.9**	54.6	51.6	23.0	51.0	90.0	51.3	57.3
ORT/fluid/food (2w)	**37.4**	35.4	40.0	49.3	40.4	18.2	38.5	35.8
BREASTFEEDING								
Breastfed (0-12m)	**68.5**	65.6	74.2	80.9	72.8	51.3	65.6	71.6
Breastfed (12-15m)	**47.4**							
Breastfed (20-23m)	**17.3**							
Exclusive (0-4 m)	**51.5**							
Bottle (0-12m)	**29.4**	32.3	23.9	25.7	31.9	29.6	31.6	27.2
Added Foods (6-9m)	**32.9**							
VITAMIN A								
Vit A 1+ (<24m)	**37.2**	48.2	18.2	44.2	19.3	56.8	37.5	37.6
Vit A 1+ (24-59m)	**51.0**	60.5	32.4	62.0	28.2	68.3	50.4	51.6
IODIZED SALT								
Iodized Salt (HH)	**72.2**	72.4	71.9	38.7	87.2	72.0		

Table 4: List of MICS Indicators:

1. **Water and Sanitation:**
   - Table 1 - Proportion of population with access to safe water at convenient distance.
   - Table 2 - Proportion of population with access to safe sanitation at convenient distance.

2. **Education:**
   - Table 1 - Net enrollment rate (6-11) years.
   - Table 2 - Gross enrollment rate (6-15) years.
   - Table 3 - Primary school entry rate (6) years.

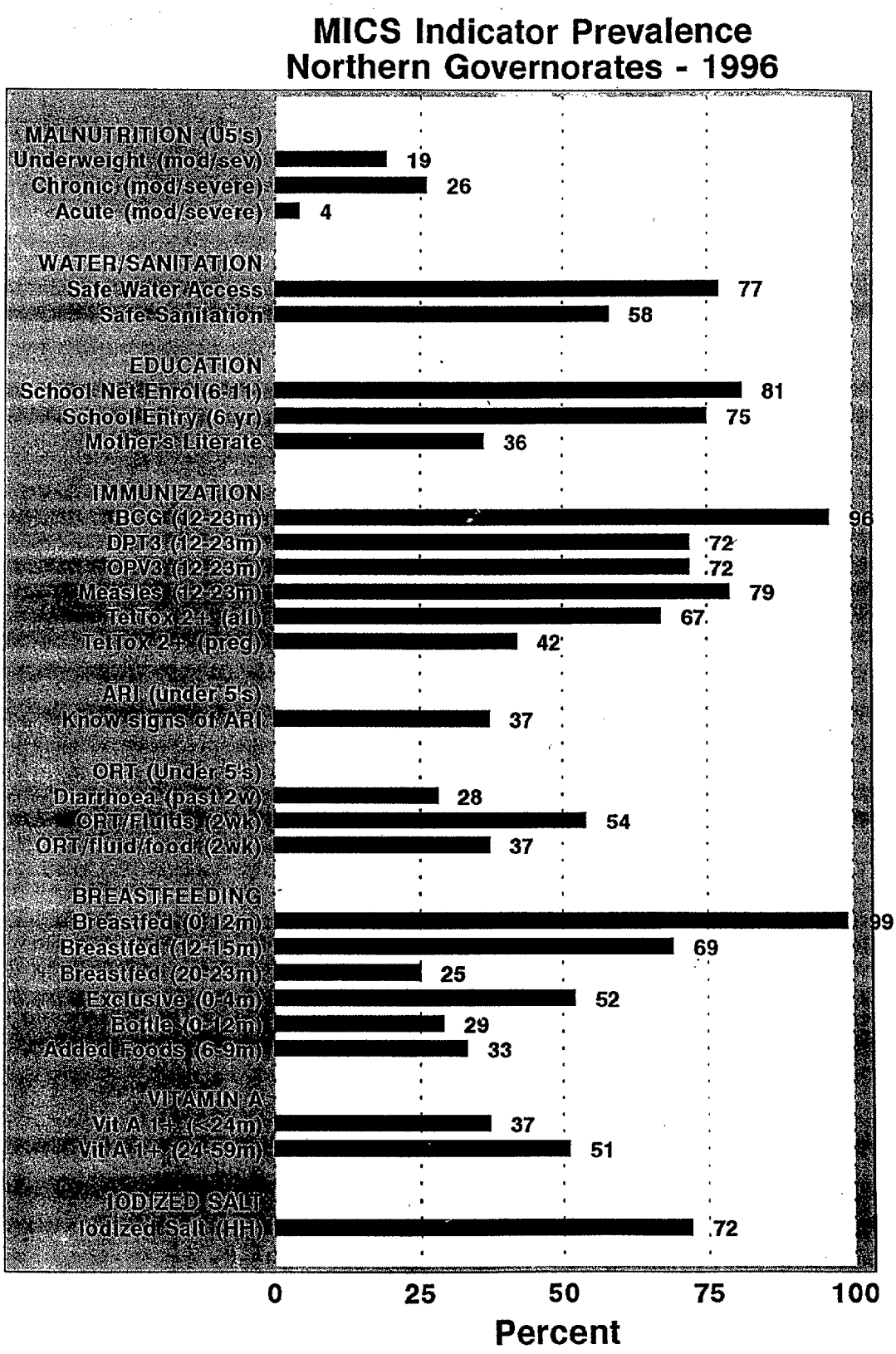
3. **ARI:**
   - Table 1 - Proportion of mothers of U5 children who know the signs of ARI.

4. **EPI:**
   - Table 1 - Proportion of mothers with U5 children receiving at least two doses of TT during and before last pregnancy.
   - Table 2 - Proportion of mothers with children 0-11 months who received TT2 doses during last pregnancy.
   - Table 3 - Proportion of children (12-23) months covered by BCG.
   - Table 4 - Proportion of children (12-23) months old receiving at least three doses of DPT.
   - Table 5 - Proportion of children (12-23) months old receiving at least three doses of OPV.
   - Table 6 - Proportion of children (12-23) months old receiving Measles vaccine.

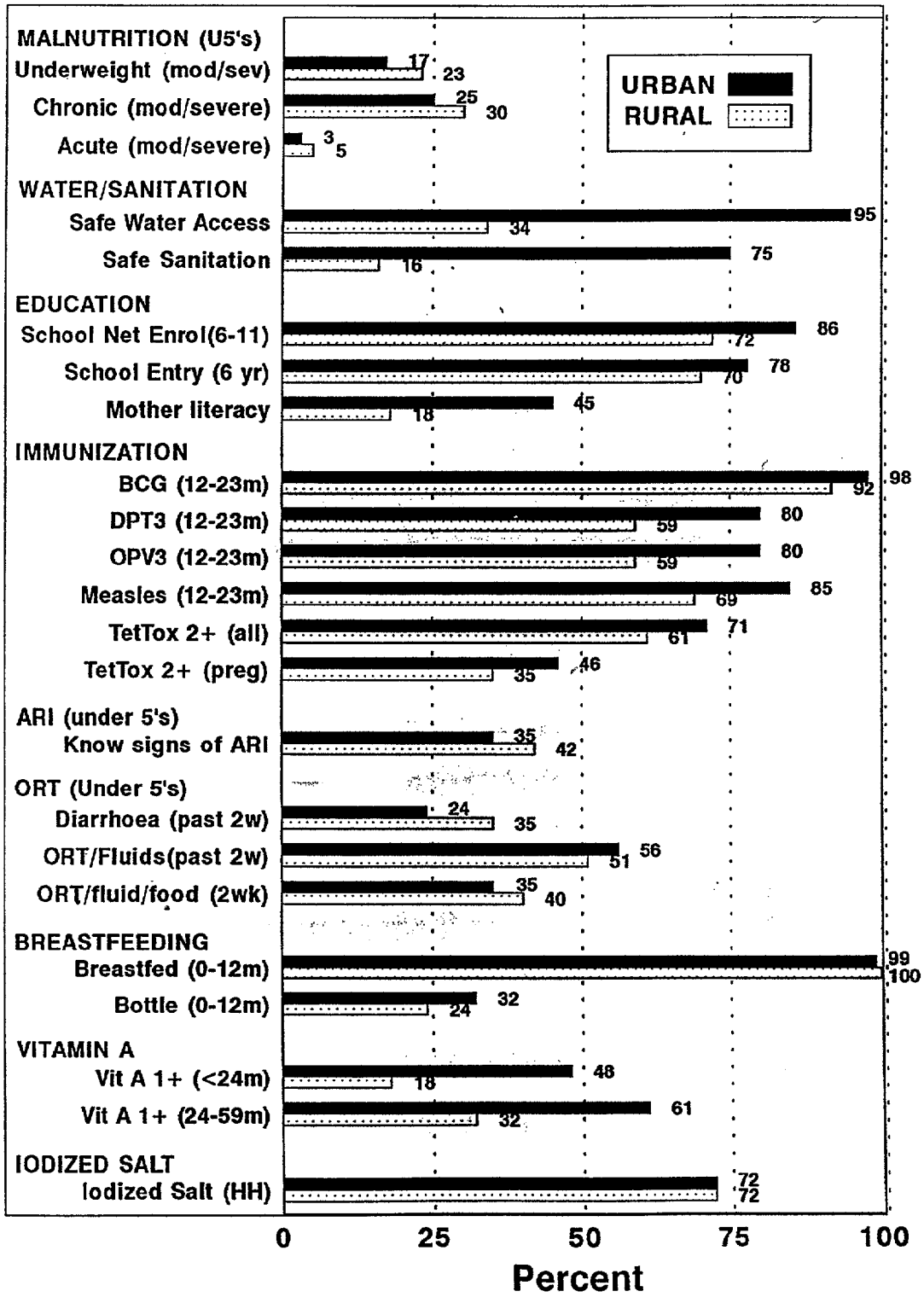
5. **CDD:**
   - Table 1 - Proportion of diarrhoea cases among U5 in two weeks before survey who received ORT and recommended home fluids (Pre-1993 definition).
   - Table 2 - Proportion of diarrhoea cases among U5 in one month before survey who received ORT and recommended home fluids (Pre-1993 definition).
   - Table 3 - Proportion of diarrhoea cases among U5 in two weeks before survey who received ORT and increased fluids and continued feeding (Post 1993 definition).
   - Table 4 - Proportion of diarrhoea cases among U5 in one month before survey who received ORT and increased fluids and continued feeding (post 1993 definition).

6. **Breast Feeding:**
   - Table 1 - Proportion of infants less than 12 months old ever breastfed.
   - Table 2 - Proportion of infants less than 12 months old who received any food or drink from a bottle.
   - Table 3 - Proportion of infants less than 4 months old exclusively breastfed.
   - Table 4 - Proportion of infants (12-15) months old still breastfed.
   - Table 5- Proportion of infants (20-23) months old still breastfed.

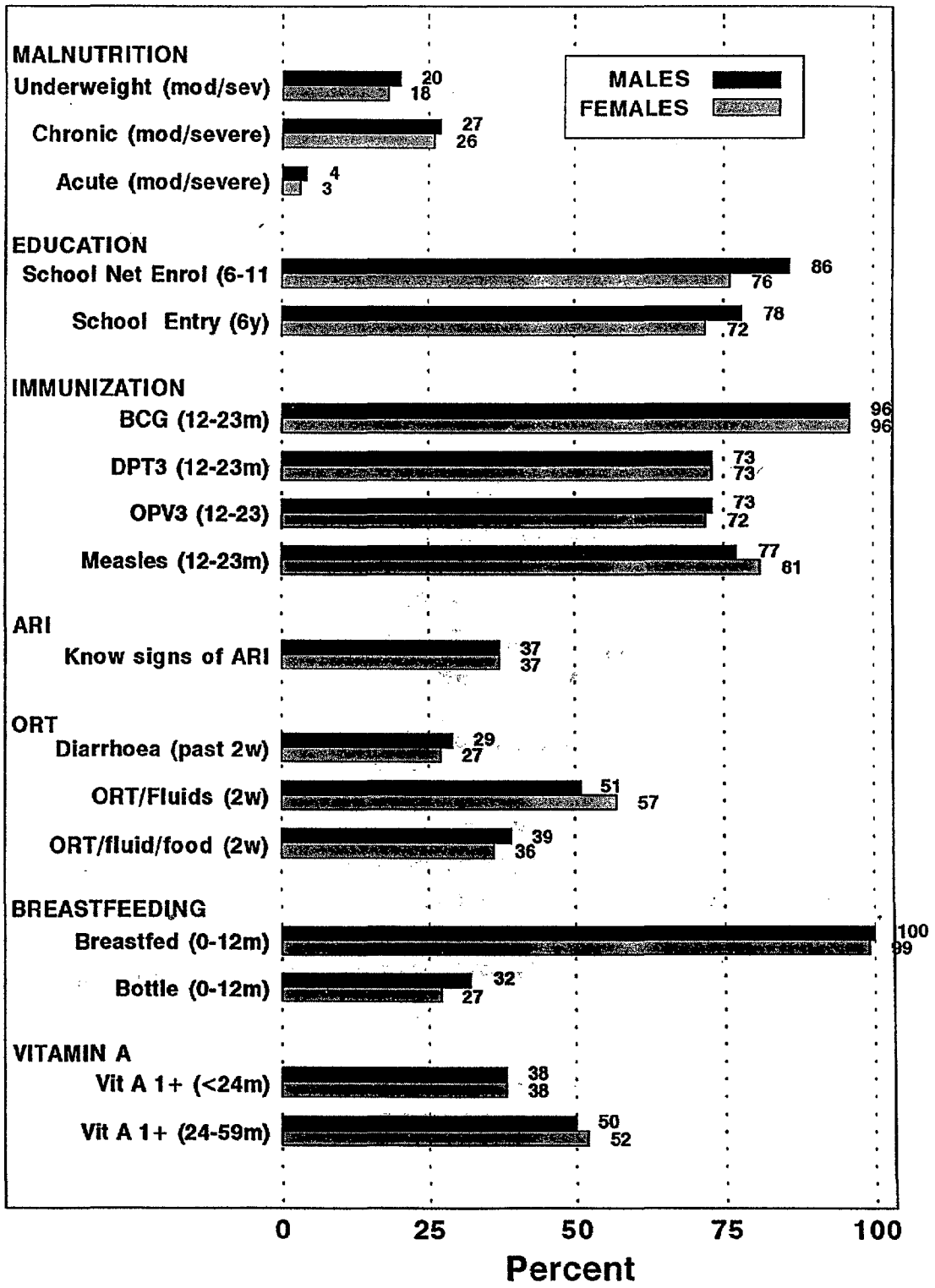
7. **Nutrition:**
   - Table 1 - Proportion of U5 who fall below (-2SD) from median Weight for Age.
   - Table 2 - Proportion of U5 who fall below (-2SD) from median Height for Age.
   - Table 3 - Proportion of U5 who fall below (-2SD) from median Weight for Height.
   - Table 4 - Proportion of U5 who fall below (-3SD) from median Weight for Age.
   - Table 5 - Proportion of U5 who fall below (-3SD) from median Height for Age.
   - Table 6 - Proportion of U5 who fall below (-3SD) from median Weight for Height.
   - Table 7 - Proportion of U2 receiving Vitamin A supplementation.
   - Table 8 - Proportion of households consuming adequately iodized salt.



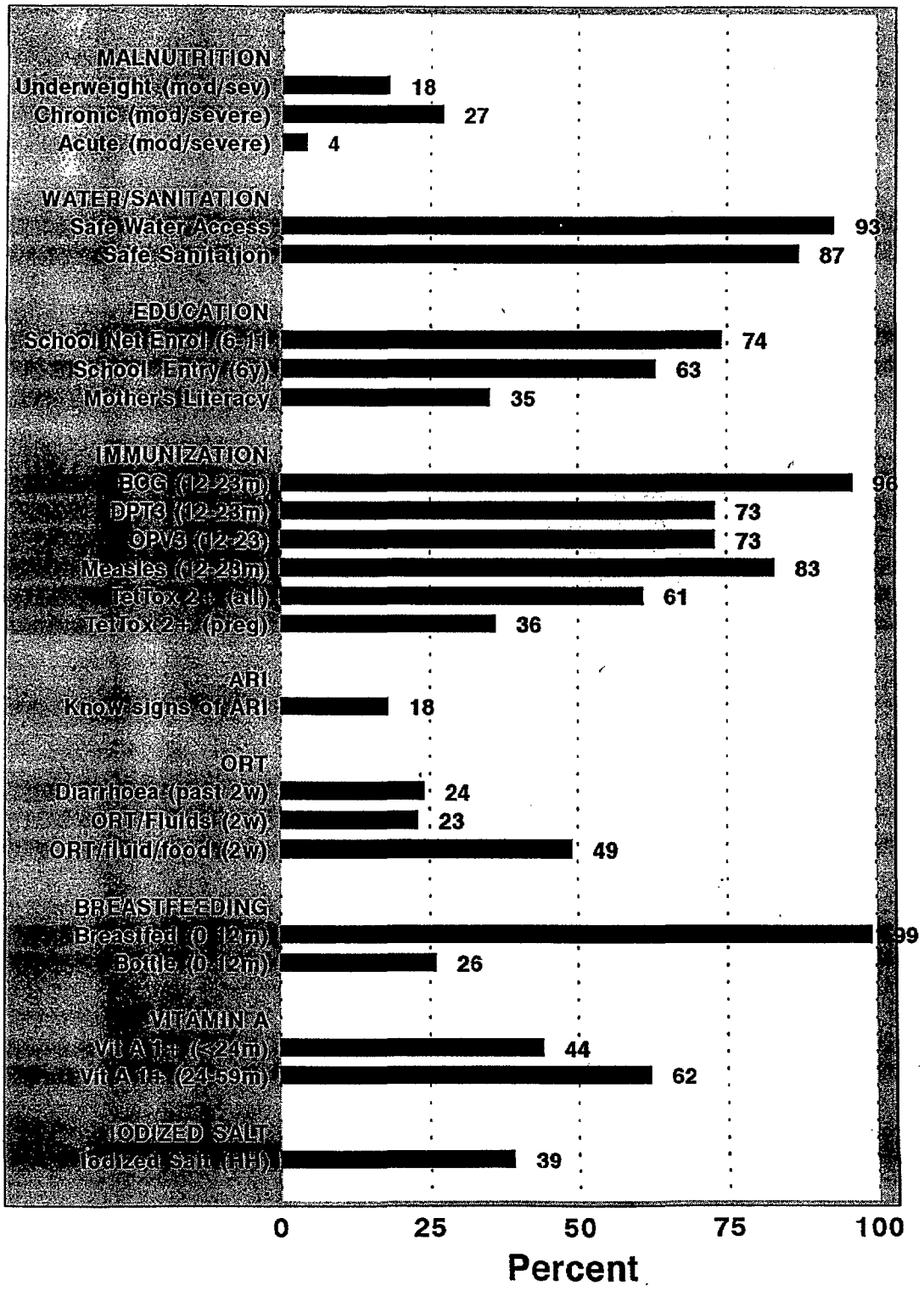
MICS Indicator Prevalence (Urban/Rural)
Northern Governorates - 1996



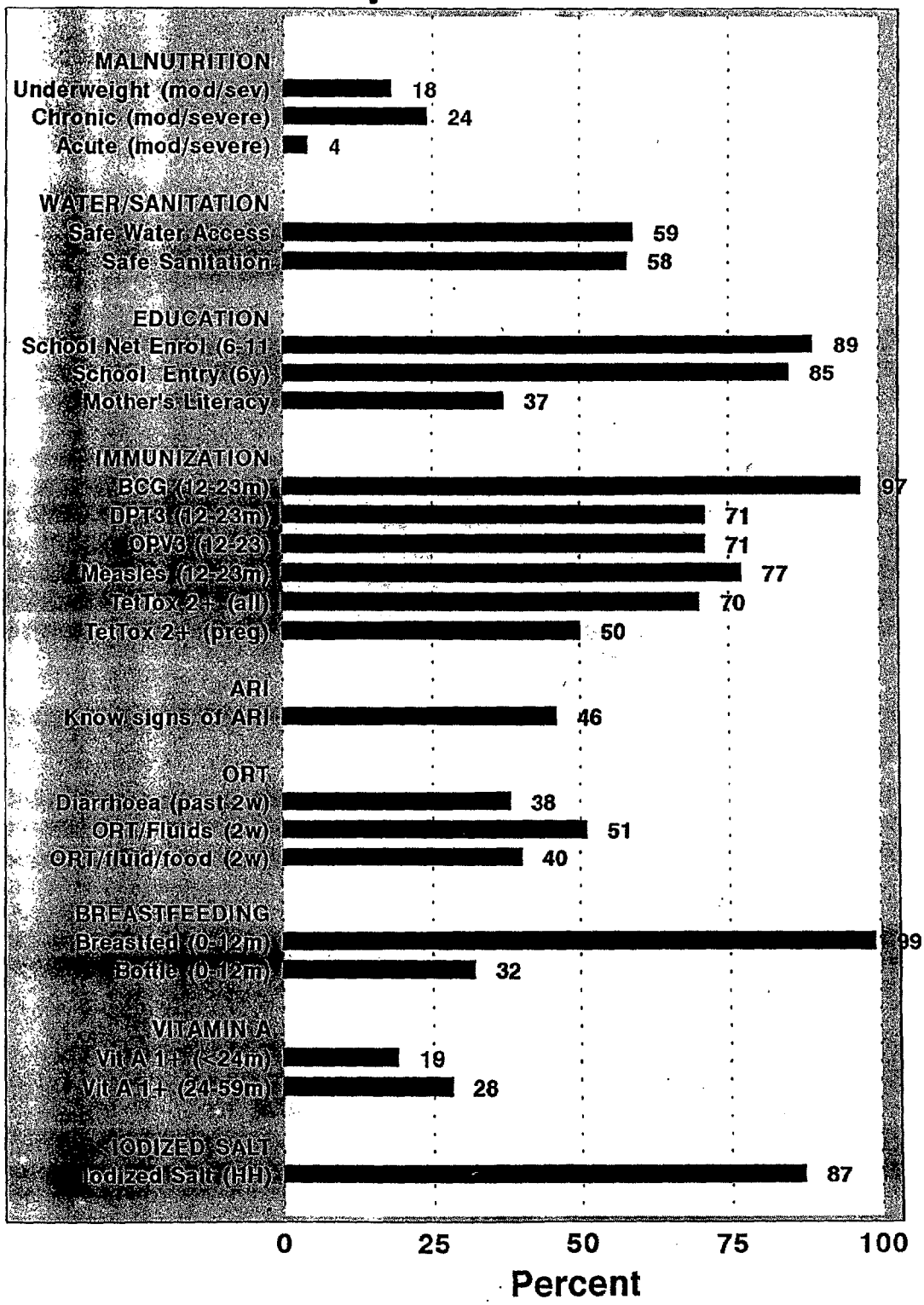
MICS Indicator Prevalence - 1996
Northern Governorates - Sexes compared



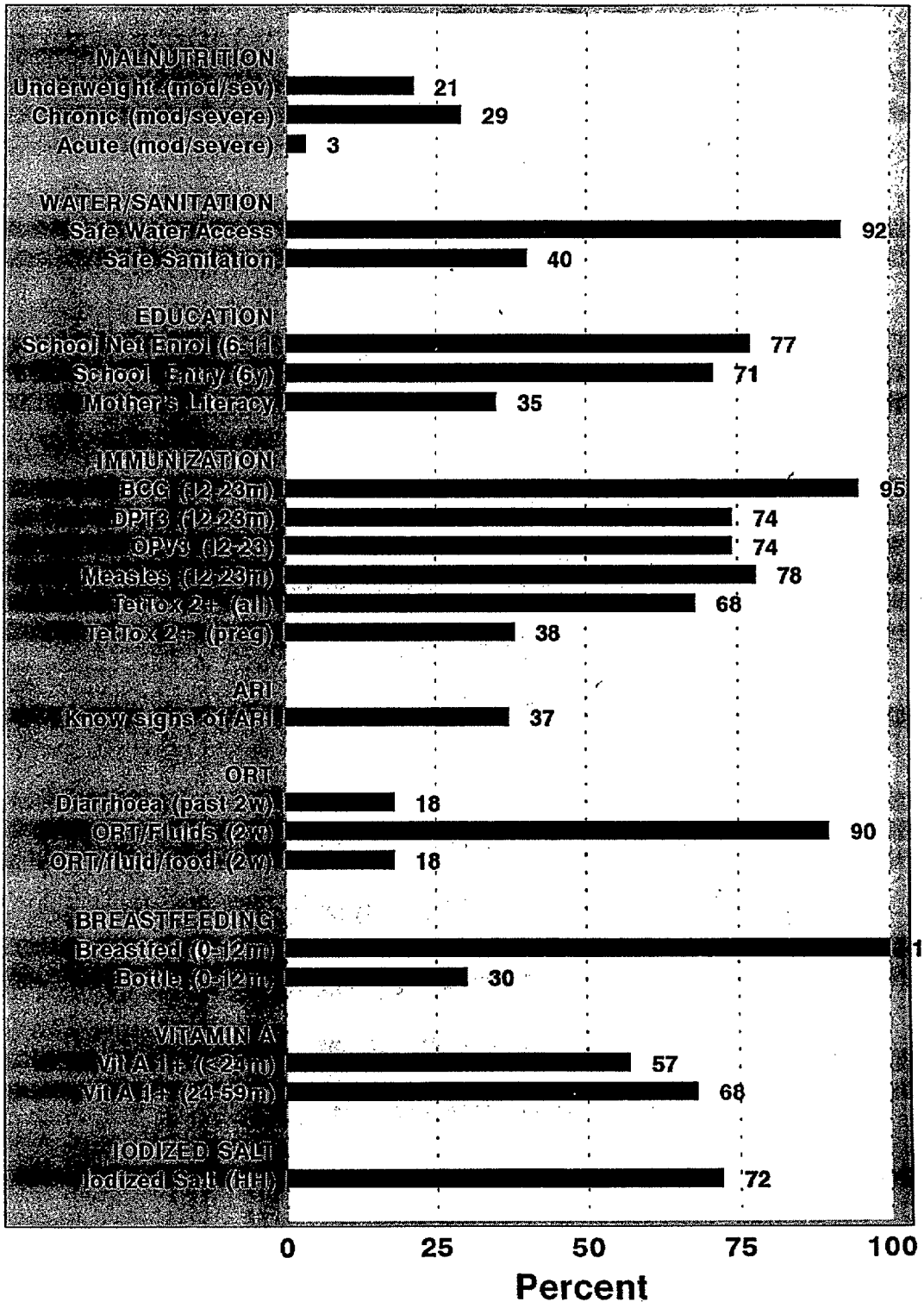
MICS Indicator Prevalence (Northern Iraq)
Dohuk Governorate - 1996



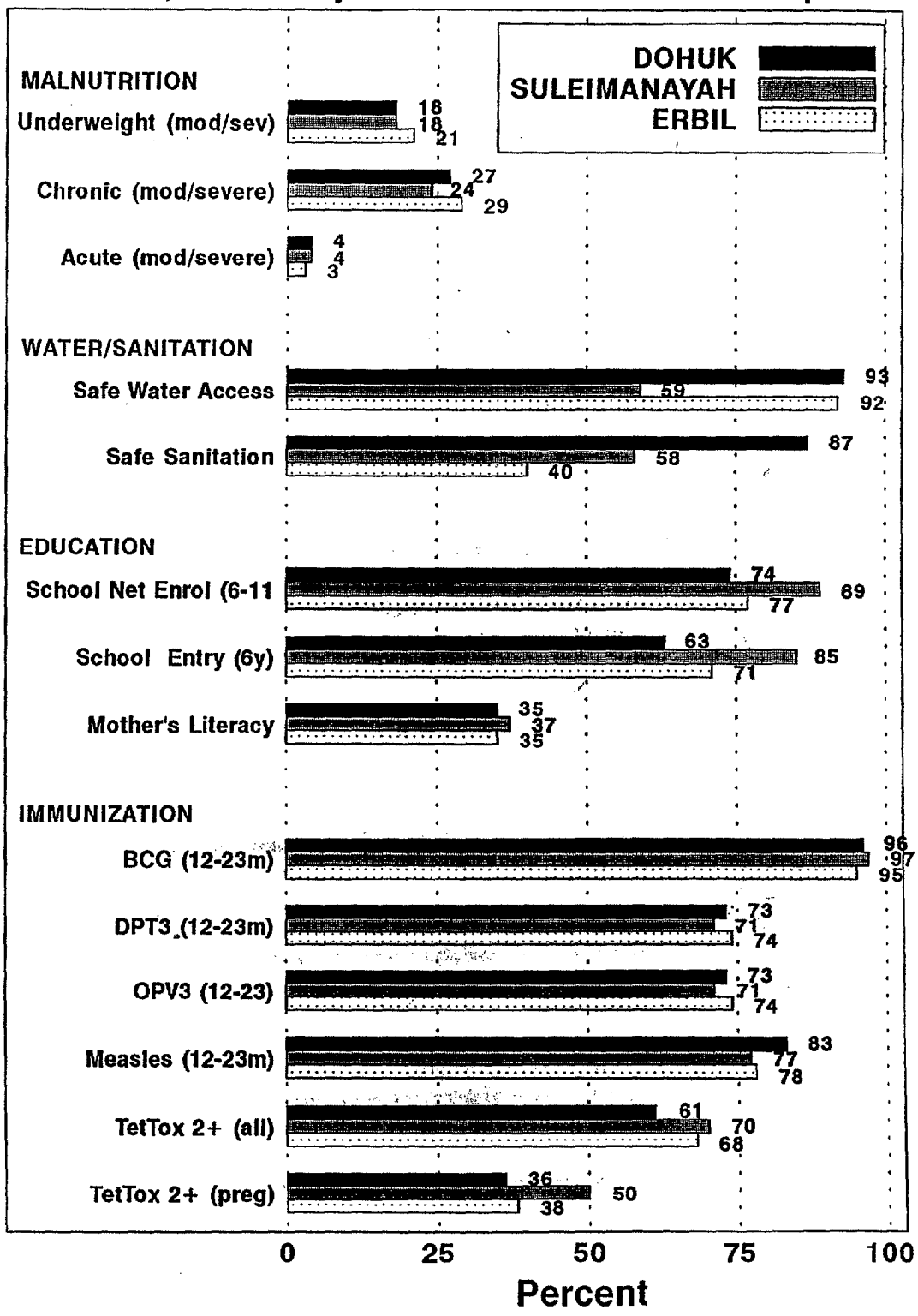
MICS Indicator Prevalence (Northern Iraq)
Suleimanyah Governorate - 1996



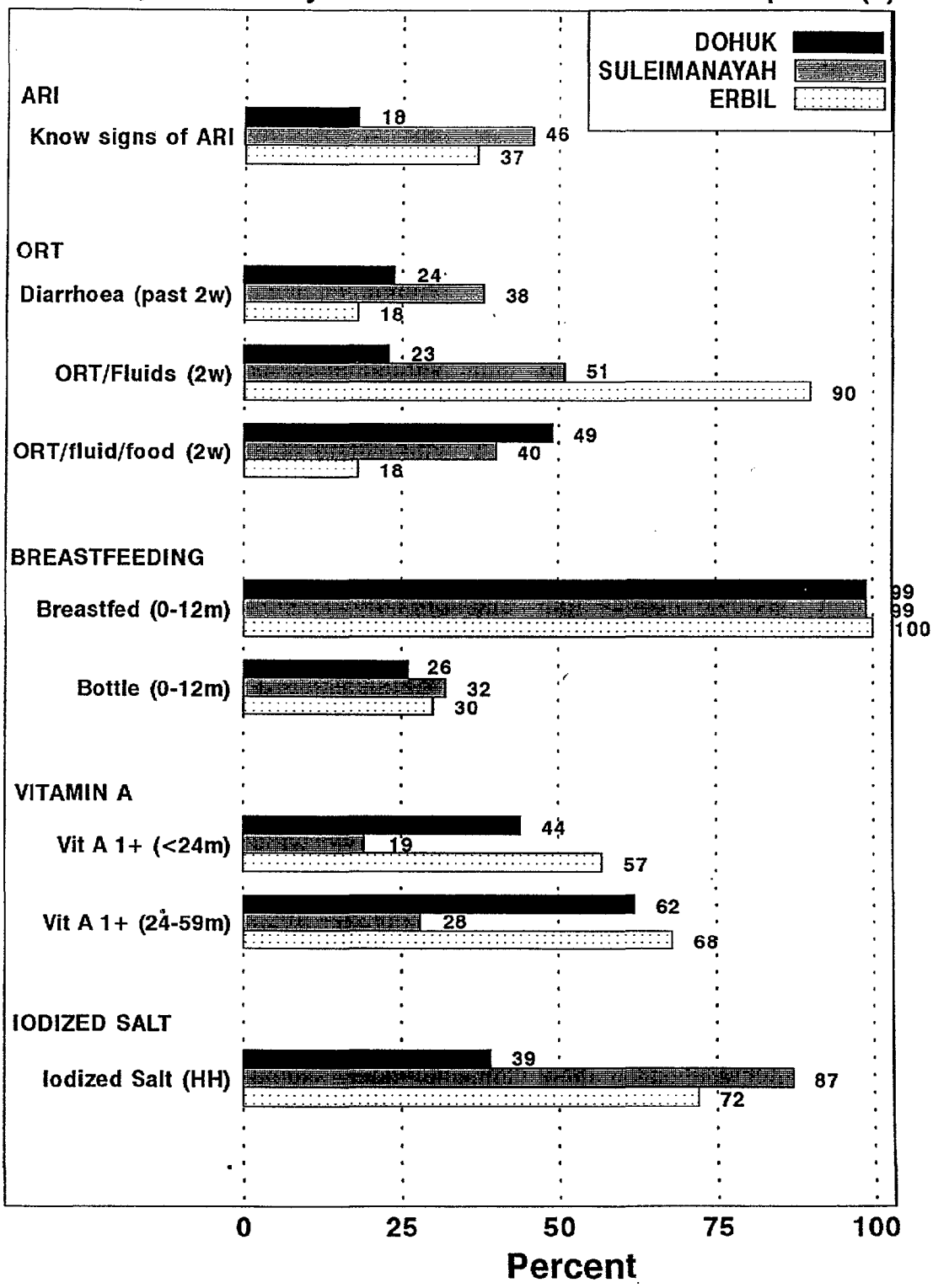
MICS Indicator Prevalence (Northern Iraq)
Erbil Governorate - 1996



MICS Indicator Prevalence - 1996
Dohuk, Suleimanayah and Erbil Governorates compared



MICS Indicator Prevalence - 1996
Dohuk, Suleimanayah and Erbil Governorates compared (2)



INDICATORS FROM MULTIPLE INDICATOR SURVEY
IRAQ (NORTHERN GOVERNORATES) - 1996

IMMUNIZATION

Table (1.1)
Proportion of children (12-23) months covered by BCG

Governorate		Governorate Level									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							96.0			47	39	86
	Female							95.8			21	34	55
	Total	100.0			81.8			**95.9**	92.0	99.9	68	73	**141**
Suleimaniyah	Male							96.9			29	24	53
	Female							96.1			32	27	59
	Total	98.1			49.9			**96.5**	92.8	100.2	61	51	**112**
Erbil	Male							95.0			34	27	61
	Female							94.9			29	23	52
	Total	96.7			90.4			**95.0**	90.7	99.3	63	50	**113**
Total	Male							96.1	93.4	98.8	110	90	200
	Female							95.7	92.7	98.7	82	84	166
	Total	**98.2**	96.2	100.0	**91.8**	86.7	96.9	**95.9**	93.6	98.2	**192**	**174**	**366**

Table (1.2)
Proportion of children (12-23) months receiving at least three doses of DPT

Governorate		Governorate Level									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							77.8			47	39	86
	Female							68.0			21	34	55
	Total	76.7			60.0			**73.0**	60.8	85.7	68	73	**141**
Suleimaniyah	Male							69.9			29	24	53
	Female							71.0			32	27	59
	Total	83.0			57.6			**70.5**	60.0	81.0	61	51	**112**
Erbil	Male							72.5			34	27	61
	Female							75.9			29	23	52
	Total	78.7			61.5			**74.0**	64.2	83.8	63	50	**113**
Total	Male	81.7			55.4			72.6	65.8	80.0	110	90	200
	Female	77.0			62.9			72.7	64.0	79.9	82	84	166
	Total	**79.6**	73.2	86.1	**59.0**	47.4	70.4	**72.2**	66.0	79.0	**192**	**174**	**366**

Table (1.3)

Proportion of children (12-23) months receiving at least three doses of OPV

Governorate		Governorate Level									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							77.8			47	39	86
	Female							68.0			21	34	55
	Total	76.7			60.0			**73.0**	60.8	85.7	68	73	**141**
Suleimaniyah	Male							69.9			29	24	53
	Female							71.1			32	27	59
	Total	83.0			57.6			**70.5**	60.0	81.0	61	51	**112**
Erbil	Male							72.5			34	27	61
	Female							75.9			29	23	52
	Total	78.7			61.5			**74.0**	64.2	83.8	63	50	**113**
Total	Male	81.7			55.4			72.6	65.8	79.7	110	90	200
	Female	77.0			62.9			71.7	63.6	79.9	82	84	166
	Total	**79.6**	73.2	86.1	**59.0**	47.4	70.4	**72.2**	65.9	78.7	**192**	**174**	**366**

Table (1.4)

Proportion of children (12-23) months old receiving Measles vaccine

Governorate		Governorate Level									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							84.5			47	39	86
	Female							82.2			21	34	55
	Total	88.1			67.3			**83.3**	74.8	92.1	68	73	**141**
Suleimaniyah	Male							75.9			29	24	53
	Female							79.0			32	27	59
	Total	84.9			69.5			**77.3**	68.1	86.5	61	51	**112**
Erbil	Male							73.9			34	27	61
	Female							83.6			29	23	52
	Total	81.7			69.2			**78.2**	68.0	89.0	63	50	**113**
Total	Male	82.1			68.0			77.2	70.2	84.4	110	90	200
	Female	87.8			70.2			81.2	74.6	87.8	82	84	166
	Total	**84.7**	79.0	90.1	**69.1**	58.5	80.0	**79.1**	73.4	84.8	**192**	**174**	**366**

Table (1.5)

Proportion of mothers with U5 children receiving at least two doses of TT during and before last pregnancy

Governorate	Governorate Level									Sample sizes		
	Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	63.4			54.9			61.3	54.6	68.1	238	173	411
Suleimaniyah	75.1			62.3			69.8	64.3	75.4	189	151	340
Erbil	70.5			60.4			68.2	60.1	76.1	210	139	349
Total	70.5	65.8	75.1	60.5	54.1	66.9	67.3	63.4	71.3	637	463	1100

Table (1.6)

Proportion of mothers with U5 children receiving at least two doses of TT during last pregnancy

Governorate	Governorate Level									Sample sizes		
	Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	(38.3)			(27.4)			35.8	26.6	45.0	94	62	156
Suleimaniyah	(58.5)			(39.6)			50.1	37.7	63.0	53	48	101
Erbil	(40.7)			(31.5)			37.9	30.3	45.5	54	54	108
Total	46.2	38.6	53.7	35.1	25.4	44.7	42.4	36.1	48.7	201	164	365

( ) low sample sizes

VITAMIN A AND SALT IODIZATION

Table (5.1)
Proportion of children under 24 months receiving Vitamin A supplementation

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							49.4			64	48	112
	Female							39.4			65	50	115
	Total	46.9			36.4			**44.2**	33.7	54.8	129	98	**227**
Suleimaniyah	Male							17.6			47	54	101
	Female							20.4			48	49	97
	Total	30.7			6.7			**19.3**	11.6	26.9	95	103	**198**
Erbil	Male							54.1			65	54	119
	Female							62.4			46	46	92
	Total	66.4			33.3			**56.8**	43.2	70.3	111	100	**211**
Total	Male	50.2			15.4			37.5	29.6	45.3	176	156	332
	Female	46.8			22.0			37.6	30.5	44.6	159	145	304
	Total	**48.2**	39.7	56.6	**18.2**	12.2	24.4	**37.2**	30.9	43.5	**335**	**301**	**636**

Table (5.1)
Proportion of children 24 to 59 months receiving Vitamin A supplementation

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							63.9			73	67	140
	Female							59.9			64	63	127
	Total	63.5			58.5			**62.0**	49.0	74.9	137	130	**267**
Suleimaniyah	Male							27.0			71	78	149
	Female							29.7			63	57	120
	Total	38.1			17.0			**28.2**	19.9	36.5	134	135	**269**
Erbil	Male							68.5			117	76	193
	Female							68.5			106	77	183
	Total	74.4			48.4			**68.5**	51.3	85.8	223	153	**376**
Total	Male							50.4	40.6	60.2	261	221	482
	Female							51.6	43.1	60.1	233	197	430
	Total	**60.5**	49.3	71.8	**32.4**	20.6	44.3	**51.0**	42.5	59.4	**494**	**418**	**912**

Table (6.1)

Proportion of households consuming adequately iodized salt

Governorate	Governorate Level									Sample sizes		
	Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	41.6			29.2			38.7	31.5	45.8	411	281	692
Suleimaniyah	87.7			86.3			87.2	81.2	93.1	405	278	683
Erbil	73.7			65.9			72.0	67.9	76.0	407	264	671
Total	72.4	67.8	76.9	71.9	62.7	81.1	72.2	68.7	75.7	1223	823	2046

CDD

Table (7.1)

Proportion of diarrhoea cases among U5 in two weeks before survey who received ORT and recommended home fluids (Pre-1993) definition

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										61	36	97
	Female										73	30	103
	Total							**23.1**			134	66	**200**
Suleimaniyah	Male										67	72	139
	Female										43	54	102
	Total							**50.6**			110	131	**241**
Erbil	Male										37	40	77
	Female										38	23	61
	Total							**89.8**			75	63	**138**
Total	Male	52.7			49.3			51.3			165	148	313
	Female	59.4			54.1			57.3			154	112	266
	Total							**53.9**			**319**	**260**	**579**

Table (7.2)

Proportion of diarrhoea cases among U5 in two weeks before survey who received ORT and increased fluids and continued feeding (post-93 Def)

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										44	31	75
	Female										57	25	82
	Total							**49.3**			101	56	**157**
Suleimaniyah	Male										52	63	115
	Female										30	52	82
	Total							**40.4**			82	115	**197**
Erbil	Male										29	38	67
	Female										29	19	48
	Total							**18.2**			58	57	**115**
Total	Male	37.5			40.0			38.5			125	132	257
	Female	32.9			40.0			35.8			116	96	212
	Total	**35.4**			**40.0**			**37.4**			**241**	**228**	**469**

Table (7.1a)

Proportion of diarrhoea cases among U5 in one month before survey who received ORT and recommended home fluids (Pre-1993) definition

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										61	36	97
	Female										73	30	103
	Total							**20.5**			134	66	**200**
Suleimaniyah	Male										67	72	139
	Female										43	54	102
	Total							**51.1**			110	131	**241**
Erbil	Male										37	40	77
	Female										38	23	61
	Total							**89.9**			75	63	**138**
Total	Male	51.6			50.9			51.3			165	148	313
	Female	58.6			52.0			56.2			154	112	266
	Total							**53.4**			**319**	**260**	**579**

Table (7.2a)

Proportion of diarrhoea cases among U5 in one month before survey who received ORT and increased fluids and continued feeding (post-93 Def)

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										44	31	75
	Female										57	25	82
	Total							**51.6**	41.0	62.2	101	56	**157**
Suleimaniyah	Male										52	63	115
	Female										30	52	82
	Total							**41.6**	32.2	51.0	82	115	**197**
Erbil	Male										29	38	67
	Female										29	19	48
	Total							**15.5**	7.0	23.9	58	57	**115**
Total	Male	38.3			40.0			39.0	32.6	45.4	125	132	257
	Female	34.6			39.5			36.5	28.4	44.5	116	96	212
	Total	36.9	29.4	44.4	39.8	28.1	51.5	38.0	31.6	44.1	**241**	**228**	**469**

NUTRITIONAL STATUS

Table (11.1)

Proportion of U5 who fall below (-2SD) from median Weight for Age

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							18.9			199	147	346
	Female							16.6			203	146	349
	Total	16.5			21.6			**17.7**	14.8	20.6	402	293	**695**
Suleimaniyah	Male							19.8			139	140	279
	Female							16.8			122	111	233
	Total	15.5			21.8			**18.4**	14.0	22.9	261	251	**512**
Erbil	Male							21.8			184	130	314
	Female							20.8			154	124	278
	Total	19.5			27.5			**21.3**	15.3	27.3	338	254	**592**
Total	Male	18.1			24.6			20.3	16.6	24.0	522	417	939
	Female	16.5			21.2			18.1	15.0	21.2	479	381	860
	Total	**17.3**	13.7	21.0	**23.1**	18.6	27.5	**19.3**	16.4	22.1	**1001**	**798**	**1799**

Table (11.2)

Proportion of U5 who fall below (-3SD) from median Weight for Age

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							4.5			199	147	346
	Female							2.8			203	146	349
	Total	3.5			3.8			**3.6**	2.0	5.3	402	293	**695**
Suleimaniyah	Male							5.2			139	140	279
	Female							5.0			122	111	233
	Total	3.6			6.9			**5.1**	3.1	7.1	261	251	**512**
Erbil	Male							5.1			184	130	314
	Female							4.3			154	124	278
	Total	4.2			6.4			**4.7**	2.9	6.5	338	254	**592**
Total	Male	4.4			6.2			5.0	3.6	6.4	522	417	939
	Female	3.2			6.2			4.2	2.7	5.7	479	381	860
	Total	**3.8**			**6.2**			**4.6**	3.5	5.7	**1001**	**798**	**1799**

Table (11.3)

Proportion of U5 who fall below (-2SD) from median Height for Age

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							27.8			199	147	346
	Female							26.4			203	146	349
	Total	26.4			29.1			**27.1**	22.0	32.2	402	293	**695**
Suleimaniyah	Male							26.2			139	140	279
	Female							20.2			122	111	233
	Total	20.4			27.0			**23.5**	18.3	28.6	261	251	**512**
Erbil	Male							27.1			184	130	314
	Female							31.6			154	124	278
	Total	27.3			34.7			**29.2**	21.1	37.2	338	254	**592**
Total	Male	24.9			30.8			26.9	22.5	31.3	522	417	939
	Female	24.6			27.9			25.7	21.5	29.9	479	381	860
	Total	**24.8**	19.7	29.9	**29.5**	24.4	34.5	**26.3**	22.6	30.1	**1001**	**798**	**1799**

Table (11.4)

Proportion of U5 who fall below (-3SD) from median Height for Age

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							7.1			199	147	346
	Female							7.1			203	146	349
	Total	6.2			9.8			**7.1**	4.9	9.2	402	293	**695**
Suleimaniyah	Male							8.2			139	140	279
	Female							7.4			122	111	233
	Total	6.8			9.0			**7.8**	5.4	10.2	261	251	**512**
Erbil	Male							10.7			184	130	314
	Female							9.8			154	124	278
	Total	10.0			11.2			**10.3**	6.4	14.3	338	254	**592**
Total	Male	8.3			10.0			8.8	6.5	11.1	522	417	939
	Female	7.5			9.5			8.1	6.1	10.1	479	381	860
	Total	**7.9**			9.7			**8.5**	6.7	10.3	**1001**	**798**	**1799**

Table (11.5)

Proportion of of U5 who fall below (-2SD) from median Weight for Height

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							5.1			199	147	346
	Female							3.2			203	146	349
	Total	4.1			4.2			**4.1**	2.3	5.9	402	293	**695**
Suleimaniyah	Male							3.4			139	140	279
	Female							5.5			122	111	233
	Total	3.5			5.3			**4.3**	2.6	6.1	261	251	**512**
Erbil	Male							4.8			184	130	314
	Female							0.9			154	124	278
	Total	2.7			4.8			**3.0**	1.8	4.3	338	254	**592**
Total	Male	4.5			3.9			4.3	3.0	5.6	522	417	939
	Female	2.1			5.8			3.4	1.8	4.9	479	381	860
	Total	**3.4**	2.2	4.5	**4.8**	3.0	6.5	**3.8**	2.9	4.8	**1001**	**798**	**1799**

Table (11.6)

Proportion of U5 who fall below (-3SD) from median Weight for Height

Governorate		Governorate Level									Sample sizes		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							0.0			199	147	346
	Female							0.8			203	146	349
	Total	0.5			0.0			**0.4**			402	293	**695**
Suleimaniyah	Male							0.4			139	140	279
	Female							0.0			122	111	233
	Total	0.4			0.0			**0.2**			261	251	**512**
Erbil	Male							0.4			184	130	314
	Female							0.2			154	124	278
	Total	0.0			1.2			**0.3**			338	254	**592**
Total	Male	0.3			0.4			0.3			522	417	939
	Female	0.3			0.2			0.3			479	381	860
	Total	**0.3**			**0.3**			**0.3**			**1001**	**798**	**1799**

* All < 1.0 and too low for stable estimates

EDUCATION

Table (12.2)

Net Enrollment Rate (6-11) years

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male	88.1			55.0			77.8			201	200	401
	Female	80.8			48.7			71.1			208	199	407
	Total	84.4			51.9			**74.4**	64.9	83.9	409	399	**808**
Suleimaniyah	Male	94.0			88.7			91.5			151	159	310
	Female	91.4			79.6			86.6			140	113	253
	Total	92.8			84.9			**89.3**	85.3	93.2	291	272	**563**
Erbil	Male	88.2			76.7			85.4			204	150	354
	Female	72.8			43.8			66.4			173	112	285
	Total	81.2			62.6			**76.8**	69.5	84.1	377	262	**639**
Total	Male	90.2			79.2			86.3	82.9	89.7	556	509	1065
	Female	81.4			63.6			75.7	70.6	80.8	521	424	945
	Total	**86.0**	81.5	90.4	**72.4**	64.8	80.0	**81.4**	77.6	85.1	**1077**	**933**	**2110**

Table (12.3)

Primary School Entry (6) years

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							61.8			36	39	75
	Female							63.8			42	33	75
	Total							**62.8**	50.0	75.7	78	72	**150**
Suleimaniyah	Male							87.8			39	33	72
	Female							80.7			30	27	57
	Total							**84.7**	77.2	92.2	69	60	**129**
Erbil	Male							74.0			46	26	72
	Female							68.3			43	20	63
	Total							**71.3**	62.6	80.0	89	46	**135**
Total	Male	81.2			71.5			78.0	72.4	83.6	121	98	219
	Female	74.5			67.3			72.4	64.4	80.3	115	80	195
	Total	**78.0**	71.6	84.4	**69.9**	58.1	81.0	**75.4**	69.9	80.8	**236**	**178**	**414**

Table (12.4)

Gross Enrollment Rate (6-15) years

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male	130.8			78.5			114.6			201	200	401
	Female	107.7			61.3			93.7			208	199	407
	Total	119.1			69.9			**104.0**			409	399	**808**
Suleimanlyah	Male	133.1			123.3			128.4			151	159	310
	Female	124.1			102.7			115.3			140	113	253
	Total	128.8			114.7			**122.5**			291	272	**563**
Erbil	Male	114.2			114.7			114.3			204	150	354
	Female	97.7			58.9			89.1			173	112	285
	Total	106.6			90.7			**102.9**			377	262	**639**
Total	Male	124.7			112.5			120.3			556	509	1065
	Female	109.6			82.2			100.8			521	424	945
	Total	**117.4**			**99.3**			**111.3**			**1077**	**933**	**2110**

WATER SUPPLY AND SANITATION

Water

Table (13.1)

Proportion of households with access to safe water at convenient distance (<=\100 metres)

Governorate	Governorate Level									Sample sizes		
	Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	100.0			70.5			93.0	85.9	100.2	411	281	692
Suleimaniyah	88.7			10.4			59.4	41.7	77.1	406	278	684
Erbil	100.0			64.0			92.0	84.5	99.5	408	264	672
Total	95.4	89.1	101.6	33.7	19.6	47.7	77.1	68.4	85.9	1225	823	2048

Sanitation

Table (13.2)

Proportion of population with access to safe sanitation (sewage network or septic tank) at convenient distance (<=50m)

Governorate	Governorate Level									Sample sizes		
	Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	93.9			64.4			87.0	78.5	95.4	411	281	692
Suleimaniyah	86.2			9.7			57.6	39.8	75.3	406	278	684
Erbil	51.5			0.0			40.1	23.7	56.4	408	263	671
Total	75.1	64.8	85.3	16.2	5.6	26.7	57.7	47.7	67.6	1225	822	2047

BREASTFEEDING

Table (Breast1)

Proportion of infants less than 4 months old exclusively breastfed

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										12	10	22
	Female										11	3	14
	Total										23	13	**36**
Suleimaniyah	Male										8	6	14
	Female										13	5	18
	Total										21	13	**32**
Erbil	Male										6	11	17
	Female										3	10	13
	Total										9	21	**30**
Total	Male										26	27	53
	Female										27	18	45
	Total							**51.5**	40.3	62.8	**53**	**45**	**98**

Table (breast2)

Proportion of breastfed infants (6-9) months who received solid/mushy foods

(denominators are total number of breastfed infants)

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										19	19	38
	Female										18	9	27
	Total										37	28	**65**
Suleimaniyah	Male										3	7	10
	Female										7	9	16
	Total										10	16	**26**
Erbil	Male										9	8	17
	Female										5	6	11
	Total										14	14	**28**
Total	Male										31	34	65
	Female										30	24	54
	Total							**32.9**	24.2	41.6	**61**	**58**	**119**

Table (breast3a)

Proportion of children (12-15) months old still breastfed

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										14	5	19
	Female										11	10	21
	Total										25	15	**40**
Suleimaniyah	Male										9	13	22
	Female										4	8	12
	Total										13	21	**34**
Erbil	Male										6	2	8
	Female										3	4	7
	Total										9	6	**15**
Total	Male										29	20	49
	Female										18	22	40
	Total							**69.1**	57.3	80.9	**47**	**42**	**89**

Table (breast3b)

Proportion of children (20-23) months old still breastfed

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										10	6	16
	Female										12	10	22
	Total										22	16	**38**
Suleimaniyah	Male										9	5	14
	Female										11	5	16
	Total										20	10	**30**
Erbil	Male										5	5	10
	Female										7	10	17
	Total										12	15	**27**
Total	Male										24	16	40
	Female										30	25	55
	Total							**24.9**	14.5	35.4	**54**	**41**	**95**

Table (Breast4)

Proportion of infants less than 12 months who received any food or drink from a bottle

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male							24.9			38	40	78
	Female							26.3			54	24	78
	Total							**25.7**	18.6	32.7	92	64	**156**
Suleimaniyah	Male							37.4			23	23	46
	Female							27.0			28	24	52
	Total							**31.9**	20.6	43.2	51	57	**98**
Erbil	Male							30.4			31	25	56
	Female							28.5			20	24	44
	Total							**29.6**	18.1	41.1	51	49	**100**
Total	Male	34.7			26.1			31.6	24.2	39.1	92	88	180
	Female	30.0			21.5			27.2	19.1	35.3	102	72	174
	Total	**32.3**	25.0	39.6	**23.9**	13.2	34.6	**29.4**	23.3	35.5	**194**	**160**	**354**

Table (Breast5)

Proportion of infants less than 12 months old ever breastfed

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male										38	40	78
	Female										54	24	78
	Total							**99.1**	97.6	100.0	92	64	**156**
Suleimaniyah	Male										23	23	46
	Female										28	24	52
	Total							**98.9**	96.8	100.0	51	57	**98**
Erbil	Male										31	25	56
	Female										20	24	44
	Total							**100.0**	100.0	100.0	51	49	**100**
Total	Male							100.0	100.0	100.0	92	88	180
	Female							98.6	96.6	100.0	102	72	174
	Total	**98.9**	97.4	100.0	**100.0**	100.0	100.0	**99.3**	98.3	100.0	**194**	**160**	**354**

CONTROL OF ACUTE RESPIRATORY INFECTIONS

Table (ari1)

Proportion of mothers of U5 children who know the signs of ARI

(rapid or difficult breathing)

Governorate		Governorate									Sample		
		Urban	LCL	UCL	Rural	LCL	UCL	Total	LCL	UCL	Urban	Rural	Total
Dohuk	Male	17.1			21.8			18.3			199	147	346
	Female	17.2			14.4			16.5			203	146	349
	Total	17.3			18.0			**17.5**	12.6	22.3	402	293	**695**
Suleimaniyah	Male	42.4			44.3			43.3			139	140	279
	Female	50.0			48.6			49.4			122	111	233
	Total	45.7			46.6			**46.1**	39.3	52.9	261	251	**512**
Erbil	Male	39.1			52.3			42.3			184	130	314
	Female	36.4			46.0			38.9			154	124	278
	Total	37.9			49.8			**40.9**	29.1.	52.8	338	254	**592**
Total	Male	34.6			42.5			37.3	31.7	42.8	522	417	939
	Female	35.3			41.3			37.3	31.4	43.2	479	381	860
	Total	**35.0**	28.3	41.6	**42.3**	33.3	51.4	**37.3**	32.2	42.6	**1001**	**798**	**1799**

(vis anthro)

RELATIONSHIPS BETWEEN NUTRITIONAL STATUS AND KEY INDICATORS

1 ACCESS TO SAFE WATER

	Adeq	Inadeq
WA <-2	18.4	22.8
WH <-2	3.3	6.1
HA <-2	25.8	27.6
WA <-3	3.9	6.4
WH <-3	0.3	0.4
HA <-3	8.2	8.9

WA <-2 Mod/severe Underweight-for-age
WH <-2 Mod/severe Acute malnutrition
HA <-2 Mod/severe Chronic malnutrition

WA <-3 Severe Underweight-for-age
WH <-3 Severe Acute malnutrition
HA <-3 Severe Chronic malnutrition

2 ACCESS TO SAFE SANITATION

	Adeq	Inadeq
WA <-2	17.7	21.7
WH <-2	3.3	4.7
HA <-2	22.8	30.8
WA <-3	3.3	6.1
WH <-3	0.3	0.3
HA <-3	6.4	11.0

suggestive of differences between the prevalence rates

3 PLACE OF LAST CHILD BIRTH

	Instit.	Home
WA <-2	13.3	22.5
WH <-2	3.5	4.1
HA <-2	19.1	30.2
WA <-3	2.9	5.5
WH <-3	0.2	0.3
HA <-3	4.5	10.6

4 EDUCATION OF MOTHER

	Illiterate	prim	higher
WA <-2	22.5	15.4	9.7
WH <-2	4.3	4.3	1.2
HA <-2	31.0	20.2	13.2
WA <-3	5.8	1.9	2.8
WH <-3	0.4	0.0	0.0
HA <-3	10.3	5.4	3.9

5 NUMBER OF HOUSEHOLD MEMBERS

	1-4	5-7	8+
WA <-2	21.2	15.8	21.5
WH <-2	4.0	3.0	4.6
HA <-2	32.8	20.3	27.0
WA <-3	6.6	3.5	4.2
WH <-3	0.2	0.3	0.3
HA <-3	11.7	6.4	8.3

6 BIRTH INTERVAL FOR LAST TWO CHILDREN

	<24m	24-35	36+m
WA <-2	21.2	22.4	15.0
WH <-2	3.7	3.2	4.5
HA <-2	31.1	30.3	19.7
WA <-3	5.4	4.8	3.6
WH <-3	0.3	0.1	0.2
HA <-3	10.5	9.8	5.2

RELATIONSHIPS BETWEEN NUTRITIONAL STATUS AND KEY INDICATORS (1)
Stratified by Education, Governorate, Urban/rural and Age of the Child

1 ACCESS TO SAFE WATER

Mod/sev	EDUCATION	Adeq	Inadeq
WA <-2	illiterate	21.5	25.3
	primary	16.6	11.1
	higher	8.3	21.7
WH <-2	illiterate	3.4	6.4
	primary	4.0	6.0
	higher	1.5	0.0
HA <-2	illiterate	31.0	30.0
	primary	21.8	14.5
	higher	10.3	43.3

	GOVERNORATE	Adeq	Inadeq
WA <-2	Dohuk	17.2	24.4
	Suleimanayah	16.1	22.7
	Erbil	21.4	22.2
WH <-2	Dohuk	4.0	6.1
	Suleimanayah	3.2	5.6
	Erbil	2.8	9.5
HA <-2	Dohuk	27.0	28.0
	Suleimanayah	19.3	27.3
	Erbil	29.3	28.8

	REGION	Adeq	Inadeq
WA <-2	urban	17.3	17.9
	rural	24.2	23.4
WH <-2	urban	3.2	7.1
	rural	3.3	6.0
HA <-2	urban	24.8	25.0
	rural	31.2	27.9

	AGE IN YEARS	Adeq	Inadeq
WA <-2	0-1	14.3	30.6
	1-2	26.2	37.7
	3-5	17.1	14.0
WH <-2	0-1	4.4	6.9
	1-2	9.3	12.7
	3-5	0.9	3.1
HA <-2	0-1	8.9	21.7
	1-2	26.1	30.9
	3-5	31.0	28.4

2 ACCESS TO SAFE SANITATION

Mod/sev	EDUCATION	Adeq	Inadeq
WA <-2	illiterate	22.1	22.9
	primary	16.0	15.2
	higher	6.4	25.8
WH <-2	illiterate	4.0	4.3
	primary	2.8	7.5
	higher	1.7	0.0
HA <-2	illiterate	28.3	33.3
	primary	21.0	19.6
	higher	7.6	32.6

	GOVERNORATE	Adeq	Inadeq
WA <-2	Dohuk	17.3	20.4
	Suleimanayah	17.8	19.2
	Erbil	18.0	24.1
WH <-2	Dohuk	3.8	6.2
	Suleimanayah	4.1	4.5
	Erbil	1.6	4.6
HA <-2	Dohuk	25.4	31.2
	Suleimanayah	20.7	25.4
	Erbil	21.0	35.6

	REGION	Adeq	Inadeq
WA <-2	urban	16.9	18.7
	rural	24.6	23.5
WH <-2	urban	3.1	4.2
	rural	4.7	5.0
HA <-2	urban	22.4	32.6
	rural	27.0	29.7

	AGE IN YEARS	Adeq	Inadeq
WA <-2	0-1	14.4	22.7
	1-2	24.1	38.1
	3-5	16.4	16.5
WH <-2	0-1	3.5	6.9
	1-2	9.7	10.8
	3-5	1.0	1.8
HA <-2	0-1	9.6	16.0
	1-2	22.8	34.3
	3-5	27.3	34.8

RELATIONSHIPS BETWEEN NUTRITIONAL STATUS AND KEY INDICATORS (1)

Stratified by Education, Governorate, Urban/rural and Age of the Child

3 PLACE OF LAST CHILD BIRTH **4 EDUCATION OF THE MOTHER**

Mod/sev	EDUCATION	Instit.	Home
WA <-2	illiterate	16.9	26.0
	primary	11.3	18.0
	higher	6.1	13.5
WH <-2	illiterate	4.4	4.2
	primary	3.5	4.7
	higher	0.9	1.6
HA <-2	illiterate	24.2	34.0
	primary	16.6	22.4
	higher	7.6	19.1

	GOVERNORATE	Instit.	Home
WA <-2	Dohuk	14.6	21.1
	Suleimanayah	13.6	20.2
	Erbil	11.9	26.2
WH <-2	Dohuk	3.9	4.3
	Suleimanayah	3.9	4.5
	Erbil	2.6	3.5
HA <-2	Dohuk	22.7	31.8
	Suleimanayah	17.6	25.6
	Erbil	16.7	35.3

	GOVERNORATE	illit	prim	higher
WA <-2	Dohuk	19.8	14.0	13.4
	Suleimanayah	21.5	14.4	10.3
	Erbil	26.6	18.1	7.4
WH <-2	Dohuk	4.4	3.3	2.5
	Suleimanayah	4.8	5.2	0.0
	Erbil	3.6	3.5	1.9
HA <-2	Dohuk	30.6	22.3	14.6
	Suleimanayah	27.8	17.3	14.5
	Erbil	36.0	23.1	11.2

	REGION	Instit.	Home
WA <-2	urban	13.4	20.6
	rural	13.1	26.1
WH <-2	urban	3.5	3.2
	rural	3.1	5.3
HA <-2	urban	18.2	30.0
	rural	24.3	30.4

	REGION	illit	prim	higher
WA <-2	urban	20.9	16.8	8.5
	rural	24.8	14.3	29.2
WH <-2	urban	3.7	3.9	1.3
	rural	5.0	5.5	0.0
HA <-2	urban	30.6	20.9	12.0
	rural	31.7	18.0	32.9

	AGE IN YEARS	Instit.	Home
WA <-2	0-1	9.3	23.1
	1-2	21.6	34.0
	3-5	12.0	18.4
WH <-2	0-1	4.6	5.6
	1-2	10.9	9.8
	3-5	0.6	1.7
HA <-2	0-1	4.8	15.6
	1-2	29.1	32.7
	3-5	23.7	33.9

	AGE IN YEARS	illit	prim	higher
WA <-2	0-1	20.6	15.9	9.8
	1-2	37.3	21.1	10.1
	3-5	18.4	13.1	9.6
WH <-2	0-1	5.4	7.7	0.0
	1-2	11.6	8.7	6.1
	3-5	1.5	1.4	0.0
HA <-2	0-1	13.6	9.6	7.6
	1-2	34.3	19.9	13.7
	3-5	36.6	24.2	14.6

RELATIONSHIPS BETWEEN NUTRITIONAL STATUS AND KEY INDICATORS (1)
Stratified by Education, Governorate, Urban/rural and Age of the Child

5 No. OF HOUSEHOLD MEMBERS

Mod/sev	EDUCATION	1-4	5-7	8+
WA <-2	illiterate	24.0	18.3	24.8
	primary	15.7	17.3	14.2
	higher	10.5	5.6	14.6
WH <-2	illiterate	3.6	4.1	4.5
	primary	6.0	1.9	5.9
	higher	4.0	1.6	0.0
HA <-2	illiterate	38.9	24.6	31.0
	primary	22.9	18.6	21.2
	higher	2.9	10.1	19.6

	GOVERNORATE	1-4	5-7	8+
WA <-2	Dohuk	22.3	10.9	17.6
	Suleimanayah	22.3	17.0	18.3
	Erbil	19.1	16.0	28.9
WH <-2	Dohuk	6.2	1.5	4.0
	Suleimanayah	3.3	2.9	6.5
	Erbil	2.6	3.8	3.1
HA <-2	Dohuk	30.7	26.3	25.4
	Suleimanayah	30.1	21.0	21.4
	Erbil	37.7	17.7	37.6

	REGION	1-4	5-7	8+
WA <-2	urban	18.4	12.3	20.9
	rural	27.2	22.5	23.0
WH <-2	urban	5.1	1.6	4.0
	rural	1.6	5.7	6.0
HA <-2	urban	29.9	17.8	28.0
	rural	39.1	26.2	27.6

6 BIRTH INTERVAL FOR LAST TWO CHILDREN

Mod/sev	EDUCATION	<24m	24-35	36+m
WA <-2	illiterate	24.9	25.4	17.3
	primary	10.3	17.1	15.0
	higher	9.1	15.7	8.4
WH <-2	illiterate	4.2	3.1	5.0
	primary	2.7	4.3	5.7
	higher	3.1	0.0	1.6
HA <-2	illiterate	34.6	36.7	22.6
	primary	21.4	21.8	19.7
	higher	18.8	12.4	12.7

	VERNORATE	<24m	24-35	36+m
WA <-2	Dohuk	17.1	19.4	15.6
	Suleimanayah	21.4	17.1	17.0
	Erbil	24.7	26.2	10.0
WH <-2	Dohuk	5.1	3.3	3.1
	Suleimanayah	4.0	2.8	4.8
	Erbil	2.3	3.3	4.5
HA <-2	Dohuk	30.0	24.2	25.5
	Suleimanayah	29.5	19.5	22.2
	Erbil	33.3	38.2	10.8

	REGION	<24m	24-35	36+m
WA <-2	urban	19.2	20.4	12.2
	rural	23.0	27.3	20.9
WH <-2	urban	2.6	3.0	3.6
	rural	4.8	3.7	6.4
HA <-2	urban	30.2	29.6	17.5
	rural	31.9	32.1	24.5

AGE IN YEARS		<24m	24-35	36+m
WA <-2	0-1	26.3	16.1	18.2
	1-2	32.8	32.0	27.4
	3-5	16.4	21.0	9.6
WH <-2	0-1	4.9	2.9	9.6
	1-2	13.1	8.2	9.3
	3-5	0.8	1.7	1.0
HA <-2	0-1	17.7	11.6	9.3
	1-2	31.1	28.4	26.7
	3-5	36.3	35.9	20.8

THE 1996 MULTIPLE INDICATOR CLUSTER SURVEY:

A SURVEY TO ASSESS THE SITUATION OF FAMILIES IN IRAQ

FINAL REPORT

WITH RESULTS FROM NORTHERN GOVERNORATES

-------- ANNEXES --------

UNICEF, Iraq
May, 1997

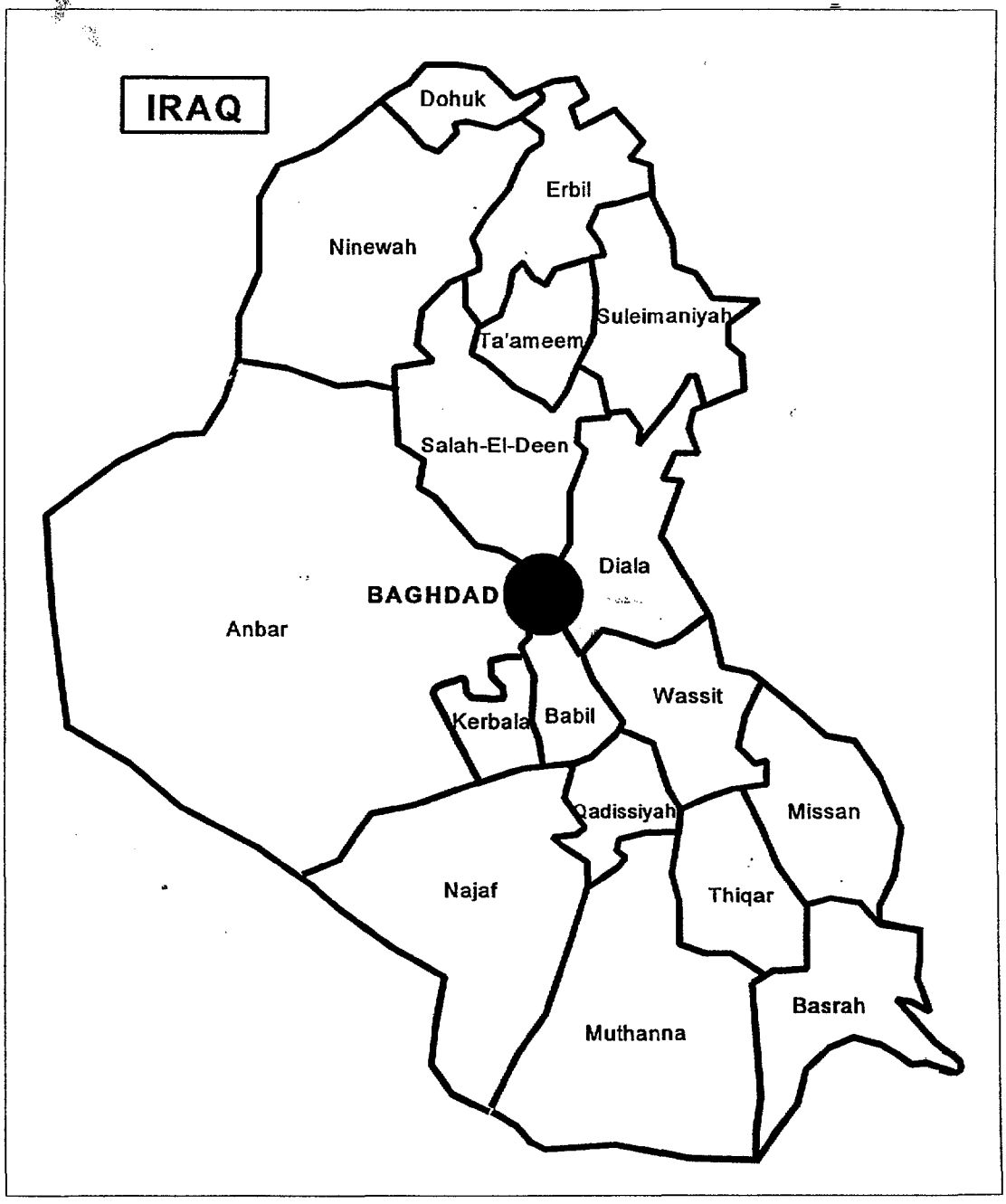
INTRODUCTION

These Annexes comprise the following:

Annex I	The sample design and sample sizes for the South/Central Region and Northern Governorates
Annex II	Data collection methods
Annex III	Definitions of main indicators used
Annex IV	The Questionnaire (English translation)
Annex V	Related documents for the survey implementation and report

CONTENTS OF ANNEXES

Map of Iraq to show Governorates in Survey



ANNEX I THE SURVEY SAMPLE

The survey sample design would provide representative results at national and at urban/rural levels as well as by sex where relevant, in order to report on the Child Summit Goals. Further, results by governorate would be useful for programmatic purposes.

In 1994, South/Central Iraq and Northern Governorates had an estimated population of 20,007,000 inhabitants, of whom 71.5% are urban dwellers. Table 1 shows some of the main demographic indicators for the population that were used in designing the sample. Table 2 shows the 1994 estimates for the 18 governorates in the country.

Two separate samples were drawn. One for the 15 south-central governorates and another for the 3 northern autonomous governorates (see Map of all governorates). Since the sampling frames differ, these will be presented separately.

1. SOUTH CENTRAL REGION

1.1 Sampling Scheme

The last National Demographic Census was carried out in 1987. Based on the population data provided by the census, a nationally representative sample was drawn for the 1993 Household Survey. The sample frame was updated in 1993, including new urban developments. From 1993 to the present time, no important population changes are believed to have occurred.

Since the 1993 survey has served as the basis for the present survey sample, it will be discussed in some detail. The survey had three strata: two urban (A and B) and one rural. The sample design for the 1993 household survey are described in Box 1.

The 1993 survey produced a probability sample with similar selection probabilities for the urban A and the rural stratum. The selection probability for the small urban stratum B (according for 11% of the urban population) was about half that of stratum A.

The 1996 Multiple Indicator Cluster Survey used the 1993 sample as a master sample, but several changes were made resulting in a sample which excluded Urban Stratum B (see Box 2).

1.1.1 Urban/rural ratio of clusters.

Based on the sample size calculations (see item 1.2), 17 clusters with an average of 25 households each were required in each governorate. Since the proportion of urban households in the 1987 census ranged from 40% to 100%, but this survey used a fixed number of urban and rural clusters in each governorate (12 and 5 respectively) the governorate-level estimates were weighted, according to the actual urban/rural population ratio in each (see below for weighting factors). The CSO made use of the municipality-specific definitions for urban and rural areas, based on official city limits. Unlike other countries, there is no incentive to define some rural areas as urban for taxation purposes. Although the boundaries are defined at municipal level and therefore lack of uniform criteria, is unlikely that this biased the sample or produced substantial misclassification

1.1.2 Sample Size for South-Central Region

The sample size was estimated at 425 households per governorate, including 17 clusters with 25 households each. For the whole region (15 governorates), the total desired sample size was calculated to be 6,375 households.

Sample size calculations were based on estimating a given proportion (coverage) with a predefined acceptable margin of error, with 95% confidence. Based on the international literature, design effects due to clustering were estimated as being equal to 2.0 for all variables except water and sanitation coverages, for which the design effect was 10.0. Further details of the assumptions used in the calculations are given in the footnotes to Table 3 and 4, and in the Multiple Indicator Cluster Survey Handbook (UNICEF 1995).

BOX 1. **Summary of Sampling Scheme for 1993 Survey**

Urban Stratum "A"

This stratum included cities with more than 20,000 inhabitants, accounting for 89% of the urban population of the country. The sample was drawn in two stages:

- **First stage.** All cities were divided into replicates, each containing approximately 90 blocks (clusters) of about 25 households each. Therefore, the number of replicates varied with the size of the city. In every replicate, two clusters were selected systematically (1280 in all).
- **Second Stage.** All households in the selected clusters were enumerated and nine were randomly selected. The selection probability for households in this stratum is thus (2/90)x(9/25) or 0.0080.

Urban Stratum "B"

This stratum included owns with less than 20,000 inhabitants, accounting for 11% of the country's urban population. The sample had three stages:

- **First stage.** All 176 towns were listed with their respective populations, and 42 were selected with probability proportionate to size (PPS).
- **Second stage.** In each selected town (with an average number of 43.8 clusters), two clusters were chosen systematically.
- **Third stage.** All households in the selected clusters were enumerated and nine were randomly selected. The selection probability is thus (42/176)x(2/43.8)x(9/25) or 0.0039.

Rural Stratum

The rural sample also had three stages:

- **First stage.** All 10,323 villages in the country were listed with their respective populations, and 212 were selected in proportion to the size of the village population (PPS).
- **Second stage.** Each chosen village was divided into blocks of between 15-20 households (based on the 1987 census blocks), for a total of 636 blocks in all. (Villages averaged 3.3 blocks). Three blocks from each village were selected systematically.
- **Third stage.** The chosen blocks were re-enumerated, and nine of the 15 or so households in the selected blocks were randomly selected. The selection probability is thus (212/10,323)x(3/3.3)x(9/15) or 0.0113.

BOX 2. Sampling Scheme for the South-Central Region (Based on 1993 Master Sample shown in Box 1)

Urban Stratum:

- **First stage.** As described in Box 1 for Stratum A, all cities (>20,000 inhabitants) were divided into replicates, each containing approximately 90 blocks of about 25 households each. In all 640 replicates, two blocks were selected systematically, for a total of 1280 blocks. For Stratum B, all 176 towns (<20,000) were listed with respective populations, and 42 were selected with probability proportionate to size (PPS). Two blocks were chosen systematically (84 blocks total), for a grand total of 1364 blocks. (The 1987 census urban strata contained a total of 67503 blocks from which this selection was made).

For the 1996 survey, the above-selected urban clusters were listed and 12 blocks were chosen systematically in each governorate. These blocks were re-enumerated in March and April of 1996 and all the households in these blocks were included in the sample (average number of households per cluster=25).

Because Stratum B of the 1993 survey presented only 11% of the urban population, and blocks in both urban strata were combined for the master sample, none of the 84 blocks in the master sample's Stratum B were selected into the systematic sample. Thus, the urban population in towns of less than 20,000 inhabitants is not represented in the 1996 survey sample. The probability of selection for the urban sample is thus (1364/67503)(15x12)/1364= 0.004.

Rural Stratum

First stage. As shown in Box 1, all 10,323 villages were listed with their respective populations, and 212 were selected proportional to the size of the village population (PPS).

For the 1996 Multiple Indicator Survey, five of the above-selected villages were chosen systematically in each governorate (a total of 75 in all). All households in these villages were enumerated and segmented (average segments per village=2), of which one segment was selected randomly. All households in these segments were included (average number of households per cluster=25). The probability of selection for the rural sample is thus (212/10323)(75/212)(1/2)=0.004.

1.2.1 Sample size at the national level.
Table 3 shows the sample sizes required to estimate the national indicators with a margin of error of plus or minus three percentages points. All sample sizes are smaller than the proposed sample of 6,375 households. The only exception was tetanus toxoid coverage for pregnant women, for which the margin of error was 3.5 points.

The actual number of households interviewed in South-Central Iraq was 6138 households. A total of 237 households were listed, but not successfully interviewed, for a non-response rate of 3.7% for the overall sample (see Table 9)

1.2.2 Sample size at the governorate level.
Table 4 shows the sample size calculations for governorates. Since these figures will be mainly used for programmatic purposes, the denominator for the indicators have been expanded. Immunization coverage at the governorate level refers to children ages 12-59 months, vitamin A and tetanus toxoid in pregnancy coverages refer to all under fives, and ORT refers to diarrhoea episodes in the previous month. With these adaptations and given a governorate-level sample of 425 households, all indicators may be assessed with a margin of error of nine percentages points or less, which is adequate for the purposes for which they will be used. Achieved sample sizes for each governorate are also shown in Table 4.

1.3 Weighting for the South-Central Region
The following factors were considered when weighting the sample:

1.3.1 Urban/rural weights for governorate estimates
No major shift in the urban/rural distribution of the population had occurred between 1987 and the 1993 up-dating that created the master sample. Weighting factors were calculated using the 1987 Census proportions urban and rural and the proportion of households found in the 12 urban and 5 rural clusters in each governorate. These weights are shown in Table 7.

1.3.2 Governorate weights for national estimates.
Since a fixed number of clusters (17) were taken in each governorate, the governorate-level estimates had to be weighted, taking into consideration the proportion of population living in each governorate according to the sampling frame, in order to produce the national estimates. These weighting factors are also shown in Table 7.

1.3.3 Urban and rural weights for national estimates.
A third set of weights were calculated to produce national urban and national rural estimates, depending on the proportion of households in urban clusters in each governorate and the proportion of households in rural clusters in each governorate.

2. NORTHERN GOVERNORATES

2.1 Sampling Scheme

A complete count of the population in the three Northern Autonomous governorates (Dohuk, Erbil, Suleimaniya) was carried out in 1995 under the supervision of UN Agencies. This provided an updated sampling frame for the MICS.

According to the sample size calculations (see item 2.2), the sample included 29 clusters (17 urban and 12 rural), with 25 households in each governorate, reproducing the urban/rural ratio in the region. The choice of a larger number of clusters in each Northern governorate, relative to those in the South-Central region where only 17 clusters were studied, was due to the desire to have sufficient precision when reporting for the whole northern autonomous region which is made up of only three governorates, compared to the 15 governorates in the South-Central region. The sampling scheme is shown in Box 3.

BOX 3. Sampling Scheme for Northern Region (Based on 1995 household count)

Urban Stratum:
- **First stage.** All cities and town in each governorate were listed with their respective populations sizes, and 17 were chosen with PPS. Large cities were selected more than once.
- **Second stage.** All mahallas (neighborhoods) in the selected cities were listed with their respective population sizes, and one (or more, if the city was selected more than once) was selected, also with PPS.
- **Third stage.** Each selected mahallas was divided into four approximately equal-sized segments, of which one was randomly chosen. This segment was then divided into four smaller segments of which one was again chosen, and so forth until the chosen segment was judged to have about 100 households. A sketch map of the chosen segment was then drawn and further divided into blocks of about 25 households, of which one was randomly selected for the sample. The households in this segment were identified through painted markings (up to a total of 25) and marked on the sketch map given to field teams.

Rural Stratum:
- **First stage.** All villages in each governorate were listed with their respective numbers of households, and 12 were chosen with PPS.
- **Second stage.** Sketches maps of the selected villages were drawn and segments of 25 households were identified. One of these segments was chosen at random, the houses identified by painted numbers on doors or walls, and marked on the sketch map given to field teams.

2.1.1 Selection of clusters of households

The third stage of the urban sample and the second of the rural sample are based on the segmentation approach. This method provides a strict probability sample. Enumeration was not used because some mahallas and villages are very large, including up to thousands of households, and this process would be difficult due to the very large number of clusters in some mahallas, so that segmentation in successive steps was used. The sampling fraction in each mahalla was equal to 25 divided by the 1995 household count in the whole mahalla (estimated by dividing the population count by the average household size in the Northern region sample).

2.1.2 Urban/rural ratio

The fixed urban/rural ratio - 17 and 12 clusters, respectively - was chosen for practical reasons, and also because there was relatively little variation between governorates in the urban/rural distribution of the population. Weighting was required, however (see item 2.3.1).

2.2 Sample Size for the Northern Region

The Northern Region sample included 725 households per governorate, and 2175 in total. This sample size is adequate for estimating all MDG indicators for the Northern autonomous region with a margin of error of 6.5 percentage points or less, as Table 5 shows. The calculation in this table refer to the "worst possible" statistical situation, in which all indicators are equal to 50%. For each of the Northern governorates, the margin of error of the estimates was lower than those for the Southern governorates (see Table 4), since 725 households were studied instead of 425.

2.3 Weighting for the Northern Region

The following weights were used:

2.3.1 Urban-rural weights

Since a fixed number of urban (17 or 58.6%) and rural (12 or 41.4%) clusters were selected in each of the three governorates, the actual observed urban/rural ratios were taken into account in weighting the results within governorates and for the whole region. The weighting factors used are shown in Table 7.

2.3.2 Governorate-specific weights

As for the South-central region (see item 1.3.3 above), the results for the three governorates were weighted, to produce the estimates for the Northern region as a whole. These weights are shown in Table 7.

2.4 Weighting Factors for Pooling the South-Central and Northern Region Result

Since different sampling fractions were used, weighting was also necessary to pool the two sets of results from the South-central region and the Northern region. The proportion of the total Iraqi population living in the Northern governorates has remained approximately stable between 1987 (census) and 1995 (population count of northern governorates), with the exception of Dohuk governorate where the initially small population approximately doubled (Table 8).

It is known that mass population movements affected this governorate to a larger extent than the other two governorates. Therefore, the 1995 population proportions were used for calculating weights, both for producing estimates for the Northern region as a whole, and for pooling these results with those from the South-central region to give estimates for the Iraqi population as a whole.

Table 1. Basic information for sampling

Estimate for 1994 *	Urban	Rural	Total
Total population	14,308,400	5,698,600	20,007,000
Population proportion	71.5%	28.5%	100.0%
Average household size **	7.6	9.2	8.1
Number of households	1,882,684	619,413	2,502,097
Number of children aged 12-23 months	415,400	214,500	629,900
Number of households needed to locate one child aged 12-23 months	4.5	3.0	4.0

* CSO projections based on 1987 Census of Iraq.
** 1993 Household Socio-economic survey of South-Central Iraq.

Table 2. Estimates of Iraqi Population by Governorate and Sex in 1994 (in thousands) * based on CSO projection

Governorate	Male	Female	TOTAL
South-Central Iraq			
Anbar	476.4	477.7	954.1
Babylon	683.5	669.9	1,355.2
Baghdad	2,134.7	2,047.7	4,182.4
Basrah	604.6	600.7	1205.3
Diala	570.2	557.5	1,127.7
Kerbala	336.3	329.5	665.8
Missan	288.2	273.5	561.7
Muthana	199.8	187.9	387.7
Najaf	380.9	364.1	745.0
Nineveh	908.0	873.8	1,781.8
Qadisiyah	324.1	313.0	637.1
Salahuddin	416.1	429.6	845.7
Ta'meem	297.8	329.7	627.5
Thiqar	586.5	555.8	1142.3
Wasit	329.3	324.3	653.7
Sub total (South/Central)	**8,536.4**	**8,334.7**	**16,873.0**
Northern Region			
Dohuk	156.5	165.5	322.0
Suleimaniya	603.4	633.3	1,236.7
Erbil	503.9	531.5	1,035.4
Sub total (Northern)	**1,263.8**	**1,330.3**	**2,594.1**
GRAND TOTAL	**9,800.2**	**9,665.0**	**19,467.1**

** Thus 476.4 = 476,400*

Table 3. Sample size calculations for the South-Central Region

Indicator	Target population	Estimated prevalence	Margin of error	Required number of households	Required number in target group	Actual sample in target group
DPT3	12-23 months	0.80	0.03	6170	1422	
Measles Coverage	12-23 months	0.95	0.03	1832	422	
OPV3 Coverage	12-23 months	0.91	0.03	3158	728	
BCG Coverage	12-23 months	0.80	0.03	6170	1422	
TT2 Cov. (pregnancy)	12-23 months	0.72	0.03	5712	1317	
Vitamin A Coverage	12-23 months	0.80	0.03	3085	1422	
Iodized salt consumed	Households	0.91	0.03	728	728	
ORT use in Diarrhoea	Diarrhoea <5yr	0.79	0.03	5118	1475	
Percent low weight /age	All <5 year- old	0.44	0.03	1900	2190	
School Enrolment	6-11 year-olds	0.94	0.03	435	501	
Safe Water	Population	0.78	0.03	942	7627	
Sanitation	Population	0.70	0.03	1152	9333	

Assumptions: 8.2 persons per household; 14% of the population < 5 years; Design effect=2 (=10 for water/sanitation); Diarrhoea prevalence=25%

Table 4. Sample size calculations for governorate-level samples, South-Central Region

Indicator	Target population	Estimated prevalence	Margin of error	Required number of households	Required number in target group	Actual sample in target group
DPT3	12-59 months	0.80	0.06	386	365	
Measles Coverage	12-59 months	0.95	0.05	165	152	
OPV3 Coverage	12-59 months	0.91	0.05	284	262	
BCG Coverage	12-59 months	0.80	0.06	386	356	
TT2 Cov. (pregnancy)	Pregnant	0.72	0.06	389	448	
Vitamin A Coverage	12-59 months	0.80	0.06	309	356	
Iodized salt consumption	Households	0.91	0.05	262	262	
ORT use in Diarrhoea	Diarrhoea <5 yr	0.79	0.09	355	164	
Percent low weight /age	All <5 year- old	0.44	0.07	239	402	
School Enrolment	6-11 year-olds	0.94	0.04	245	282	
Safe Water	Population	0.78	0.02	424	3432	
Sanitation	Population	0.70	0.03	230	1867	

Assumptions: As for Table 3.

Table 5. Sample size calculations for the Northern Autonomous Region

Indicator	Target population	Estimated prevalence	Margin of error	Required number of households	Required number in target group	Actual sample in target group
DPT3	12-23 months	0.50	0.06	2054	473	
Measles Coverage	12-23 months	0.50	0.06	2054	473	
OPV3 Coverage	12-23 months	0.50	0.06	2054	473	
BCG Coverage	12-23 months	0.50	0.06	2054	473	
TT2 Cov. (pregnancy)	12-23 months	0.50	0.06	2054	473	
Vitamin A Coverage	12-23 months	0.50	0.05	1735	800	
Iodized salt consumed	Households	0.50	0.03	1633	1633	
ORT use in Diarrhoea	Diarrhoea <5 yr	0.50	0.06	1928	556	
Percent low weight /age	All <5 year- olds	0.50	0.03	1928	2222	
School Enrolment	6-11 year-olds	0.50	0.03	1828	2222	
Safe Water	Population	0.50	0.02	1975	16000	
Sanitation	Population	0.50	0.02	1975	16000	

Assumptions: As for Table3

Table 6. Population of the Northern governorates according to the 1987 Census and the 1995 household count

Population (number and % of total Iraq population) according to				
Governorate	**1987 Census**	**Households**	**1995 Census**	**Households**
Dohuk	293,304 (01.80%)	41,260	703,053 (3.4%)	99,841
Suleimaniyah	951,723 (05.82%)	155,962	1328,058 (6.5%)	227,016
Erbil	770,439 (04.71%)	114,040	1045,375 (5.1%)	164,774
All Northern Region	**2,015,466 (12.33%)**	**311,262**	**3076,486 (15.0%)**	**491631**
All Iraq	**16,335,199**	**2,203,870**	**20,536,100**	

Table 7. Weighting Factors by urban/rural region and governorate

Governorate	Urban	Rural	Total	Urban+Rural
South-East Region				
Anbar	0.6004	1.0213	0.6304	1.6217
Babylon	0.7469	1.5022	0.9660	2.2491
Baghdad	6.7296	0.9261	4.9418	7.6557
Basrah	1.1455	0.9506	1.0872	2.0961
Diala	0.6500	1.6075	0.9372	2.2575
Kerbala	0.5548	0.4744	0.5305	1.0292
Missan	0.4673	0.7854	0.5609	1.2527
Muthana	0.2657	0.7414	0.3938	1.0071
Najaf	0.6864	0.5883	0.6580	1.2747
Ninevah	1.9943	2.1546	2.0430	4.1489
Qadissiyah	0.5036	0.9256	0.6259	1.4292
Salahuddin	0.4464	1.1765	0.6658	1.6229
Ta'meem	0.8089	0.5319	0.7199	1.3408
Thiqar	0.8378	1.7180	1.0990	2.5558
Wasit	0.4829	0.9007	0.6077	1.3836
Total	**16.9205**	**16.0045**	**16.4671**	
Northern Region				
Dohuk	0.6637	0.2999	0.5159	0.9636
Suleimaniyah	1.2529	1.0946	1.1885	2.3475
Erbil	1.1248	0.4938	0.8767	1.6186
Total	**3.0414**	**1.8883**	**2.5811**	
NATIONAL TOTAL	**19.9619**	**17.8929**	**19.0482**	

Table 8. Number and percent of households by urban/rural and governorate (In 1987 Census for Central and Southern Region)

Governorate	Urban		Rural		Total	
	No. and % urban in governorate	% of total	No. and % rural in governorate	% of total	No.	%
Anbar	46,207 (58.9)	3.4	32,181 (41.1)	6.0	68,388 (100.0)	4.1
Babylon	62,690 (54.9)	4.6	51,524 (45.1)	9.6	114,214 (100.0)	6.0
Baghdad	547,972 (94.2)	40.4	33,572 (05.8)	6.2	581,544 (100.0)	30.7
Basrah	89,119 (73.9)	6.6	31,544 (26.1)	5.9	120,663 (100.0)	6.4
Diala	52,019 (48.5)	3.8	55,135 (51.5)	10.2	107,154 (100.0)	5.7
Kerbala	44,246 (73.0)	3.3	16,405 (27.0)	3.1	60,651 (100.0)	3.2
Missan	39,094 (58.8)	2.9	27,378 (41.2)	5.1	66,472 (100.0)	3.5
Muthana	20,300 (49.3)	1.5	20,881 (50.7)	3.9	41,181 (100.0)	2.2
Najaf	58,187 (74.1)	4.3	20,341 (25.9)	3.8	78,528 (100.0)	4.1
Ninevah	145,148 (67.9)	10.7	68,493 (32.1)	12.7	213,641 (100.0)	11.3
Qadissiyah	41,285 (57.1)	3.1	30,973 (42.9)	5.7	72,258 (100.0)	3.8
Salahuddin	35,355 (46.9)	2.6	40,024 (53.1)	7.4	75,379 (100.0)	4.0
Ta'meem	67,217 (76.3)	5.0	20,914 (23.7)	3.9	88,130 (100.0)	4.7
Thiqar	65,886 (53.6)	4.9	57,010 (46.4)	10.6	122,896 (100.0)	6.5
Wasit	39,862 (55.7)	2.9	31,647 (44.3)	5.9	71,509 (100.0)	3.8
TOTAL	**1,354,586 (71.6)**	**100.0**	**538,022 (28.4)**	**100.0**	**1,892,608 (100.0)**	**100.0**
1995 Counting Population: estimation data - Northern Region						
Dohuk	76,256 (76.4)	22.0	23,585 (23.6)	16.2	99,841 (100.0)	20.3
Suleimaniyah	141,853 (62.5)	41.0	85,163 (37.5)	58.6	227,016 (100.0)	46.2
Erbil	128,283 (77.9)	37.0	36,491 (22.1)	25.2	164,774 (100.0)	33.5
TOTAL	**346,392 (70.5)**	**100.0**	**145,239 (29.5)**	**100.0**	**491,631 (100.0)**	**100.0**

Table 9 Number of Target, Actual Sample Size and % Response Rate for 1996 MICS Survey.

Governorate	Target Sample Size			Actual Sample Size			Response Rate%		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Anbar	300	125	425	276	113	389	92.0	90.4	91.5
Babylon	300	125	425	301	123	424	100.3	98.4	99.8
Baghdad	300	125	425	292	130	422	97.3	104.0	99.3
Basrah	300	125	425	279	119	398	93.0	95.2	93.7
Diala	300	125	425	287	123	410	95.7	98.4	96.5
Kerbala	300	125	425	286	124	410	95.3	99.2	96.5
Missan	300	125	425	300	125	425	100.0	100.0	100.0
Muthana	300	125	425	274	101	375	91.3	80.8	88.2
Najaf	300	125	425	304	124	428	101.3	99.2	100.7
Ninevah	300	125	425	261	114	375	87.0	91.2	88.2
Qadissiyah	300	125	425	294	120	414	98.0	96.0	97.4
Salahuddin	300	125	425	284	122	406	94.7	97.6	95.5
Ta'meem	300	125	425	298	141	439	99.3	112.8	103.3
Thiqar	300	125	425	282	119	401	94.0	95.2	94.4
Wasit	300	125	425	296	126	422	98.7	100.8	99.3
Sub-total	**4500**	**1875**	**6375**	**4314**	**1824**	**6138**	**95.9**	**97.3**	**96.3**
Northern Autonomous Governorate									
Dohuk	425	300	725	412	282	694	96.9	94.0	95.7
Suleimaniya	425	300	725	406	279	685	95.5	93.0	94.5
Erbil	425	300	725	409	265	674	96.2	88.3	93.0
Sub-total	**1275**	**900**	**2175**	**1227**	**826**	**2053**	**96.2**	**91.8**	**94.4**
TOTAL	**5775**	**2775**	**8550**	**5541**	**2650**	**8191**	**96.0**	**95.5**	**95.8**

ANNEX II DATA COLLECTION PROCEDURES

Ensuring the validity of indicators of child health and nutritional status measured in the 1996 survey is of utmost importance. The following describes the preparations undertaken for the field implementation of the survey to ensure that data collected in the survey are of high quality.

1. Questionnaire

1.1 Contents

The questions employed in the 1996 Iraq survey were designed to measure standard indicators[1] of the following:

1. Access to safe water and sanitation
2. Salt iodization
3. Education
4. Safe motherhood (place of delivery and attendant at delivery), including tetanus toxoid immunization coverage
5. Knowledge of appropriate care of acute respiratory illness
6. Immunization coverage
7. Prevalence and treatment of diarrhoea
8. Breastfeeding practices
9. Coverage of Vitamin A supplementation
10. Nutritional status as measured by anthropometric indicators

1.2 Format

The questionnaire and training documents were developed from a questionnaire for the 1995 survey, which had been translated into Arabic. The questionnaire followed the format used for the previous survey, consisting of a cluster information sheet with identifying information for one cluster, followed by 8 question modules, with space to record information for up to 15 households, mothers, children 6-15 (for education) and children under 5 (for health). Additional pages for each module were attached, supplying each interview team with sufficient forms to complete a cluster. A copy of both Arabic and English versions of the questionnaire used in the 1996 survey are attached in Annex IV.

One major departure from the recommended format (UNICEF, 1995) is that the 1996 Iraq questionnaire does not obtain a complete list of mothers, children and their ages before proceeding to sk the standard question modules. Children are identified as between 6-15 or under 5 only when the specified module is reached. This means that heavy reliance is placed on the family to provide the requisite birth or other official certificates for every child in the household who might be eligible for the survey, or to correctly identify which children are eligible for each module. In fact, the rationing record system is widely believed to cover virtually 100% of the population, which means that every family member is registered and birth certificates obtained for newborns almost immediately. In some cases, however, interviewers noted that the recorded birth date did not appear to accurately reflect the age of the child. Only the recorded birth date was obtained in this survey.

Two training courses had been conducted using this questionnaire, and a decision was made to retain this format, but to revise some of the questions to increase reliability and validity of the information obtained. In future, a format using one questionnaire per household is advised, for ease of use in the field and for data entry.

1.3 Pre-testing

The original questionnaire was modified following a small pre-test conducted with field teams in Baghdad and Babylon prior to printing the final questionnaire. The wording of the question modules, with a few exceptions, followed that recommended in the UNICEF survey handbook (UNICEF, 1995).

1.4 Interviewer's guide

The guide (translated into Arabic) used in central training courses was already prepared for the 1995 MICS. This was supplemented by a guide to revisions made to the questionnaire following

[1] See (UNICEF survey handbook, 1995) and Chapter 1 for definitions.

pre-testing, used in the one-day follow-up training sessions (see section 2.2). Interviewers were advised to carry this guide during field work for reference.

2. Survey Field Staff

2.1 Composition of field teams

Two interview teams in each governorate, composed of two experienced CSO interviewers and a Ministry of Health representative, were all responsible for data collection. All were trained to do anthropometric measurements. At least one member of each team was female. Governorate CSO Directors acted as field supervisors (one per governorate).

The CSO teams had experience with household socio-economic surveys, but were not conversant with health data. Many terms and questions had to be explained in detail. The team member from the Department of Health in each governorate was included to assist the CSO interviewers throughout the survey.

2.2 Training courses

Two training courses for field staff were organized at CSO central headquarters in Baghdad. The training was conducted by Nebil Zeki, Mother and Child Unit, CSO Baghdad, Khalil M. Mehdi, Director, Nutrition Research Unit, Baghad, and Basil Al-Hussaini, UNICEF Iraq. The course for staff from Ninevah, Ta'meem, Kerbala, Najaf, Wasit, Qadisiyah, Salahuddin and Basrah was held 1-3 July. Staff from the remaining governorates attended 8-10 July. In all, a total of 90 governorate CSO and MOH personnel who would collect the data attended the training courses.

An external consultant Dr. P. David was asked to assess the effectiveness of the training courses by observing field teams from Baghdad and Babylon as they performed interviews in households. Although the CSO staff were experienced interviewers, these two 3 day courses were not sufficient to provide them with a full understanding of the questionnaire, or enough practice with anthropometric measuring techniques.

Only one of the 3 days was devoted to the latter. The questionnaire had not been pre-tested prior to the training, because it had already been used in 1995. However, some changes had to be made to this version in order to obtain key data to calculate the desired child health indicators, and to ensure smooth interview technique.

Further training was necessary, and a day of additional training was held for groups of governorate field teams using the final questionnaire, just prior to field work. This training day was conducted personally by Dr. Basil Al-Hussaini, UNICEF Iraq, and Abdullah Mathi, a member of the MCU team from Baghdad CSO Headquarters. The final questionnaires were delivered to the CSO governorate directors at this time. The training consisted of a complete discussion of each question and the procedures to be followed for filling in the forms, procedures for finding households and re-visiting absent households, and for supervisory checks.

Further instruction in weighting and measuring children was provided, and finally, each team member performed weight and height measurements on two children while being observed by Dr. Basil. He corrected any errors in these procedures.

This further training was conducted according to the following schedule:

30 July Field teams from Kerbala, Najaf, Qadisiyah and Babylon governorates met in Hilla.

31 July Field teams from Basrah, Missan, Thiqar and Muthana governorates met in Basrah.

1 August Field teams from Baghdad, Anbar, Diala and Wasit governorates met in Baghdad.

3 August Field teams from Salahuddin, Ninevah and Ta'meem met in Tikrit.

7-8 Aug Dr.Al Hussaini with Dr. Wardi, UNICEF focal point for the survey in the Northern autonomous governorates, met teams from each governorate for similar 1 and 1/2 days training. On the next day, the teams practiced in the field, and their questionn-aires checked and misunderstandings clarified after each interview.

2.3 Anthropometry training

The anthropometry training was organized with the assistance of the National Nutrition Research Institute in Baghdad, with further instruction and practice in the governorates, as described above. Standardization exercises were not conducted during the central training, and it was not possible to organize this during the one day of further training. Since this may lead to more inter-observer variability, especially for data on length/height, a thorough assessment of the quality of the anthropometric data will be undertaken prior to analysis

2.4 Pilot survey

Following training, a one-day pilot survey was conducted in each governorate by field teams in a cluster not included in the survey sample. Teams were de-briefed by their supervisors (the CSO director for the governorate) following each interview, forms checked, and problems discussed and resolved. Supervisors were instructed to telephone Baghdad headquarters if any problems were encountered that they could not solve. The questionnaires from this pilot survey were sent to CSO headquarters in Baghdad and checked for errors by the MCU team co-ordinating the survey. Supervisors were contacted regarding any remaining problems found.

2.5 Supervision

Supervisors were all directors of CSO governorate offices. They traveled each day with a different team, checked all returned forms for errors, sending teams back to clusters when errors or omissions were found. They re-interviewed households, and compared their results to those of the field team, correcting errors where necessary. These are standard procedures followed by CSO for all surveys.

In the North, the teams (2 CSO interviewers and one health person) were also under direct supervision of the head of the statistics office. This supervisors monitored both teams if they were working inside the city, or joined one of the teams each day if they were outside the city. It was suggested that in future, special transport be provided for the CSO director. The forms were checked on a daily basis by the supervisor, who also collected at least one repeat household in each cluster where teams had interviewed to check the team's work.

A significant amount of checking occurred, first by interviewers in the field, at the end of the day by supervisors, and again as data were entered at CSO headquarters in Baghdad. At each level, problems were resolved by sending the interviewer back to the household in question re-interview the family, if errors or omissions were not detected until the questionnaire was being processed in Baghdad, the relevant query was transmitted to the Governorate CSO director by telephone. The authority embodied in the Iraq CSO facilitated this unusually comprehensive regulation of the survey.

2.6 Central supervision

MCU staff traveled to each governorate during data collection to provide a further check on data coming in to the governorate office. A "hotline" for problems and questions was also maintained at CSO headquarters in Baghdad by MCU members.

An external consultant (Dr. Batieha) visited Iraq during field work, and traveled with BH to observe field teams in operation. The purpose of his visit was to help with field supervision, focusing on quality control issues, and assuring adherence to the agreed upon protocols set to ensure good quality control. He visited field teams at work in Baghdad, Anbar, Babylon, Diala and Baquba with Dr. Al-Hussaini and Dr. Mehdi Al-Ani. During these trips he went from house to house observing teams working, and weighting and measuring children. MCU staff were carrying out similar field trips on a daily basis all over the country.

The extreme heat and economic hardship experienced by the country were expected to have a negative influence on the field teams' morale, but Dr. Batieha observed very high quality work being done by teams who where co-operative and open to assistance and re-training when necessary. He met a few teams less motivated, and in need of more training. The need for supervisors to complete re-interviews and compare questionnaires with those of the interview teams, correcting the team where

necessary, was stressed.

Dr. Al-Hussaini visited the North in October, following the completion of field work. He and Dr. Ashwaq met with statistics office directors in Erbil and Dohuk, who had supervised field teams in those governorates. They discussed their observations in the field and together checked all forms from the North again for consistency of data collection. There was some confusion over whether children who had received Vitamin A capsules with measles had received these during a measles immunization campaign or during routine immunization. In a few clusters in Erbil governorate, interviewers were asked to go back and collect more information form the clusters again.

3. Other Preparations

3.1 Advance notification and logistics

CSO directors sent a memo informing the military Governors of the survey. Each cluster was up-dated by enumerators prior to the survey, under the direction of the CSO. Enumerators notified households at the time of enumeration that a survey would take place in the near future. Sketch maps used in rural areas of the Northern region were checked for accuracy prior to the start of fieldwork. BH re-visited randomly selected segments in villages in all 3 governorates, checking that the maps were accurate, and that households could be easily located.

Co-operation was usually good, and use of interview teams from the governorate helped to avoid problems in certain areas of the country. In the south, security considerations required that fieldwork be completed and the teams return to headquarters before şunset.

Due to fighting in Erbil and Suleimaniyah governorates in the North, field work was suspended. When the fighting stopped, teams resumed their field work, which was only completed in Erbil governorate on the 19th of September and in Suleimaniyah governorate on the 30th of September. People were very co-operative, and no refusals occurred.

All surveys forms were transported to Baghdad by CSO messenger when the survey was completed. These were checked again centrally by CSO staff from the MCU and then sent for entry into the computer database.

3.2 Equipment and supplies

Electronic scales (UNICEF Electronic Scale 890 manufactured by SECA, obtained from UNICEF Supply Section, Copenhagen), were used to weigh children. These scales weigh a mother and her child, and then the mother alone, calculating the weight of the child automatically. These performed well in the pre-tests in Baghdad and Babylon. All team members were trained in their use.

The external consultant observing field work Dr. Anwar Batieha reported that mothers were reluctant to undress the child completely. The weather was extremely hot (near 50C) for most of the fieldwork, and the children were dressed very lightly. The consultant weighed several samples of these usual articles of clothing, and found them to weigh on average about 120 grams. He recommended that this amount be subtracted from each child's weight. This recommendation was followed.

Measuring boards of standard manufacture (Shorr, Rhode Island, USA) were also supplied to each team. These also were obtained from UNICEF Supply Section Copenhagen, and had already been distributed for use in governorate Primary Health Care departments. All stationery (clipboards, pencils, erasers, etc.) were provided by UNICEF. Three UNICEF vehicles were also used for some of the field work.

3.3 Remuneration for field staff

A lunch stipend of 1000 dinars/day (around $1US at the time) was given to each team member. Food baskets were also prepared by UNICEF and will soon be distributed to all interviewers following completion of the survey.

3.4 Preparation for data entry

A data entry program was prepared by CSO staff (Bushra Abdul Jawad) written for FoxPro data entry software. Although the data forms contained data for an entire cluster, identifying information for each household, and then mother, and then each child were found on each page. Data were entered household by household,

although the columnar format of the questionnaire made this more difficult than usual. The programme created files for each section (question module) of the questionnaire, and identifying governorate and cluster information was copied automatically to each household's file, including a unique "family sequence" number. Other identifiers needed to link each form to the others were entered as each form was processed.

This program contained range checks performed at the time of data entry. A comprehensive consistency checking program was also written, to be run following entry of one cluster's questionnaires. Inconsistencies found at this time were reported to the governorate supervisors, and in some cases return visits to households were made to correct these. Basic tables for first analysis were also prepared by Dr. Mehdi Al-Ani, national consultant to UNICEF.

Tariq Ziad, national computer consultant, provided CSO staff with some basic training for the nutrition analysis program using EPI-INFO6. He also converted a raw data file prepared by the data entry programmer and supervisors, from FoxPro to be used for analysis of the nutrition data from the survey.

4. Data Collection

4.1 Survey schedule

Data collection was scheduled to take place during 18 working days beginning on 10 August. An additional 6 days were necessary to complete all the interviews, and the fieldwork was finally completed on 5 September. In all, 24 days of fieldwork were required in the South/central region. In the North, fieldwork required a total of 24 working days, but due to the fighting (see 3.1 above) did not end until 50 days from the start. Most clusters in the North took two days to complete. Interviewers traveled up to 3 hours each way to reach some remote clusters. In a few clusters, they stayed overnight to complete the second day of interviewing.

Cars (including petrol) and drivers were hired from a private contractor to transport field teams during the survey. Most clusters were within an hour's drive of the governorate capital, except in the Northern region and in the South/central governorate of Anbar. The teams returned to the capital for their mid-day rest, returning to the cluster late in the afternoon. In more distant clusters, teams took their lunch at a rest house in the area, but returned to the governorate headquarters at night. Petrol is cheap and readily available, so this did not impose a large additional cost. Final checking of questionnaires from both teams was completed in the evening by the governorate supervisor.

One team was responsible for each cluster (approximately 25 households), and completed an average of 12 interviews per day, returning to the cluster for a second day to complete the cluster. An average interview lasted for 30 minutes, but travel time between households was longer in rural areas. Most clusters were completed in two days. The working day lasted from about 8 am to 1 pm, with a mid-day rest, continuing from about 4 pm to 7 pm.

In the North, the summer scheduling of the survey was found to be useful because of the extended day provided for interviewing work. However, during the summer some villagers move to temporary tents near their original villages, which made them harder to locate and reach. This happened in about 10 of the 87 sampled villages in the North.

5. Data Entry

5.1 Procedures

Data entry was done at CSO Headquarters in Baghdad, supervised by Bushra Abdul Jawad. Frequency tables were produced, information for calculating weighting factors obtained, and calculated weights entered onto the data file for each cluster.

Data entry for the North was programmed by Tariq Ziad, who also supervised data entry by three operators at his private firm's office in Baghdad. He was in constant communication with Dr. Al-Hussaini, Dr. David and Dr. M. Ulusoy. The data were entered using EPI-INFO, and included range and consistency checks.

5.2 Summary of Data Processing for Tabulation of South/Central Data

Basic compiler was used for creation of indicators, tabulation and data manipulation.

Mainly, two tabulation programs were written for tabulation of indicators other than nutrition. In order to produce various tables necessary format changes were done and case selection statements were added.

For nutrition tables, three main programs were written. These programs refer to 6 reference files that contain critical values of weight for age, height for age and weight for height, repeated for boys and girls[2].

Three programs were written for data manipulation. DOS-SORT Programme was used when file matching was necessary. Sample weights were placed on all files with EPI-INFO program and all tabulation was done with these weights. (See table 7).

The analysis for this report was performed by Dr. P. David, Dr. M. Ulusoy and Bushra Abdul Jawad, their work overseen by the CSO team and Dr. B. Al-Hussaini, UNICEF Baghdad.

During January 1997, Dr. Kevin Sullivan (Emery University, Atlanta, USA) trained key members of the CSO computing staff in analysis, using EpiInfo. This package developed conversions for the nutritional status indicators. He also supported analysis for some of the key variables, file preparation and the weighting procedures. During February, Dr. A. Zerfas (Nutrition Consultant, UNICEF) completed the analysis and a preliminary report.

[2] Measuring change in nutritional status. Guidelines for Assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups. WHO, Geneva, 1983.

Annex III - Definition of Main Indicators

Indicator	Definition
Safe and convenient water	Proportion of population with safe water supply at convenient distance.
Safe and convenient sanitation	Proportion of population with safe and convenient sanitation.
Salt iodization	Proportion of households with salt testing positive for iodine or iodate.
Tetanus toxoid (TT) vaccine coverage	1. Proportion of mothers of (0-11) month-olds with 2 doses of TT in last pregnancy. 2. Proportion of mothers of (0-11) month-olds with at least 2 doses TT in her life time.
Control of Acute Respiratory Infections (ARI)	Proportion of mothers of U5 who know signs of ARI.
BCG coverage	Proportion of children age (12-23) months who received BCG vaccine before first birthday.
DPT coverage	Proportion of children age (12-23) months who received at least 3 doses of DPT.
OPV coverage	Proportion of children age 912-23) months who received at least 3 doses of OPV.
Measles coverage	Proportion of children age (12-23) months who received measles vaccine.
ORT use (pre-1993 definition)	Proportion of diarrhoea cases among U5 in two weeks before the survey who received ORT and/or recommended home fluids.
ORT use (increased fluids and continued feeding)	Proportion of diarrhoea cases among U5 in two weeks before the survey who took more fluids and continued eating somewhat less, the same, or more food.
Exclusive breast feeding	Proportion of infants less than four months of age exclusively breast fed.
Complementary feeding	Proportion of children age 6-9 months receiving breast milk and complementary food.
Continued breast feeding at one year, two years	1. Proportion of children age (12-15) months still breast fed. 2. Proportion of children age (20-23) months still breast fed.
Bottle-feeding rate	Proportion of infants less than 12 months old receiving any food or drink from a bottle.
Ever breast-feed rate	Proportion of infants less than 12 months old ever breast-fed.
Vitamin A supplements	Proportion of children under two years old receiving vitamin A supplement.
Nutrition status: Height for Age	1. Proportion of U5 below -2SD from the median height for age of NCHS/WHO reference 2. Proportion of U5 below -3SD from the median height for age of NCHS/WHO reference
Weight for height	1. Proportion of U5 below -2SD from the median weight for height of the NCHS/WHO ref. 2. Proportion of U5 below -3SD from the median weight for height of the NCHS/WHO ref.
Education: Net enrollment rate	Proportion of children currently enrolled in primary school at primary-school age.
Primary-school entry rate	Proportion of children of school-entry age who are currently attending grade 1.
Gross enrollment rate	Proportion of under 15 years old currently enrolled in primary school.

ANNEX IV: MICS QUESTIONNAIRE

Part 101. Household Environment

1. Household (HH) No.
2. What is the source of drinking water?
   1. Network 2. Public tab 3. River or brook 4. Well 5. Spring 6. Other
3. How far is the source from your dwelling? 1. Inside house 2. <100 meter 3. 100-500m 4. >500
4. How long does it take to get there? 1. Inside the house 2. <15 mins 3. 15-30 min 4. >30 mins
5. What kind of toilet facilities does your household use?
   1. Flush to sewage system 2. Flush to septic tank 3. Covered latrine 4. Uncovered lat.
6. How far is the toilet facility from your dwelling? 1. Inside the house 2. <50m 3. >50m
7. Salt iodization. 1. Iodized 2. Non-iodized
8. No. of family members.

Part 401. Education (all children 6-15 years of age)

1. HH No.
2. Child serial No.
3. Sex : M / F
4. Date of birth : day/month/year
5. Has he ever attended school? Yes...continue No...other person
6. Did he/she attended school during the school year 1995/96? 1. Yes 2. No
7. Which grade and year did he/she attend during the school year 95/96?
   Grade : 1. Primary 2. Secondary year:
8. Did he/she attend school during the school year 94/95? 1. Yes 2. No
9. Which grade and year did he/she attend during the school year 94/95?
   Grade : 1. Primary 2. Secondary Year:

Part 201. Safe Motherhood (Mothers of U5 children)

1. HH No.
2. Mother serial No.
3. Where did the last delivery take place?
   1. Public hospital 2. Private hospital 3. At home 4. Other
4. Who attended the delivery? 1. Physician 2. Health cadre 3. Midwife 4. TBA
5. What was the duration between the last two live deliveries?
   1. <12months 2. (12-23)months 3. (24-35)months 4. >36months
6. How many doses of TT did you receive during your last delivery?
   1. One 2. Two 3. Did not take 4. Don't know (DK)
7. How many TT doses did you take before your last delivery?
   1. Did not take 2. One 3.Two 4. Three 5. Four 6. Five 7.>5 8. DK

Part 202, ARI (Mothers of U5 children) and Mother's Education

1. HH No.
2. Mother serial No.
3. When your child is ill with cough and/or cold, what signs or symptoms would lead you to take him/her to a health unit or a doctor? (Record whatever mothers say. More than one response is possible)
   1. Has trouble sleeping 2. Has trouble eating 3. High fever 4. Fast breathing 5. Has difficulty breathing 6. Cough for >2 weeks 7. Other 8. DK
4. Mother's educational status.
   1. Illiterate 2. Read&write 3. Primary 4. Secondary 5. Diploma/BA 6. High degree 7. Other
5. Mother's employment status.
   1. Working 2. Housewife 3. Unemployment 4. Student 5. Other

Part 301, EPI (all U5 children)

1. HH No.
2. Mother serial No.
3. Child serial No.
4. Sex : 1. Male 2. Female
5. Date of birth: day/month/year
6. Was the child vaccinated with BCG? 1. Yes 2. No 3. DK
7. The No of DPT doses the child received.
   1. One 2. Two 3. Three 4.>four 5. Not immunized 6. DK
8. The No. Of Polio doses the child received.
   1. One 2. Two 3. Three 4.>four 5. Not immunized 6. DK
9. Did your child receive Polio vaccine with BCG? 1. Yes 2. No 3. DK
10. Was your child vaccinated against measles? 1. Yes 2. No 3. DK

Part 302, CDD (all U5 children)

1. HH No.
2. Mother serial No.
3. Child serial No.
4. Has the child had diarrhoea in the last two weeks?
   1. Yes 2. No 3. DK (yes...6, 2or 3...continue)
5. Has the child had diarrhoea in the last month?
   1. Yes 2. No 3. DK (yes...continue 2or 3....next person)
6. During diarrhoea, did the child take any of the following fluids?
   1. Breast milk only 2. Cereal-based gruel 3. Home made fluids 4. ORS 5. Fresh or canned milk 6. Water with feeding during some part of the day 7. Water only 8. Other fluids 9. Did not take any 10. DK

7. How much of these fluids did you give your child?
   1. Did not give 2. Very little 3. Less than usual 4. As usual 5. More than usual 6. DK
8. During diarrhoea, did you give your child a quantity of food?
   1. Did not give 2. Very little 3. Less than usual 4. As usual 5. More than usual 6. DK
9. Where was the child treated? (More than one answer is possible)
   1. Government health institution 2. Private doctor 3. At home 5. Was not treated

Part 303, Breast Feeding (all U5 children)

1. HH No.
2. Mother serial No.
3. Child serial No.
4. Did you breast feed your child? 1. Yes 2. No 3. DK (Yes.....continue 2or3.....7)
5. Is the child still breast feeding? 1. Yes 2. No 3. DK (Yes.....continue 2or3.....7)
6. Since this time yesterday, did the child receive any of the following?
   1. Vitamin or drugs 2. Water 3. Fruit juice 4. ORS 5. Powder or fresh milk
   6. Tea 7. Fresh food 8. Breast milk only 9. Did not take any food
7. Since this time yesterday, did the child take milk from the bottle? 1. Yes 2. No 3. DK
8. The period during which the child depended on exclusive breast feeding without taking any other thing.

Part 304, Nutrition (all U5 children)

1. HH No.
2. Mother serial No.
3. Child serial No.
4. Did the child take vitamin A. (More than one response is possible)
   1. With measles vaccination 2. With DPT booster dose 3. Alone or during the measles campaign
   4. Did not take 5. DK
5. The weight of the child. Kg/Gr
6. The length/height of the child. Cm/Mm

ANNEX V:

Related documents for the MICS survey implementation and report

Trip report: Visit to the Iraqi Central Statistical Organization, sample design - Caesar Victora, 6-12 June 1996

Trip report: Preparations for fieldwork - Patricia David, 14-23 July, 1996

Trip report - Anwar Batieha, 24 Aug - 6 Sept.

Text for Iraq 1996 report: training and survey implementation - Patricia David, Sept 1996

Trip report - Patricia David, 1-16 Nov. 1996

Documenting the progress on South-Central Iraq data files for Dr. Mahir Ulusoy - Patricia David 13 Nov 1996

Trip report - Mahir Ulusoy, 8-17 Nov. 1996

Trip report - Mahir Ulusoy, 8 Nov - 2 Dec. 1996

The Multiple Indicator Cluster Survey: Preliminary report, November 1996

Consultancy report -The Iraq Multiple Indicator Cluster Survey nutrition analyses; Vitamin A capsule coverage and proportion of households using iodized salt - K. Sullivan, 19 Jan - 1 Feb, 1997