THE 1996 MULTIPLE INDICATOR CLUSTER SURVEY

A SURVEY TO ASSESS THE SITUATION OF CHILDREN AND WOMEN IN IRAQ

FINAL REPORT

WITH RESULTS FROM SOUTH/CENTRE GOVERNORATES

CONDUCTED BY
CENTRAL STATISTICAL ORGANIZATIONS, IRAQ
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PREFACE

This report for South/Centre Iraq[1] complements that for the Northern Governorates, which was finalized in May, 1997. Like that for the North, it 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).

Certain items could not be included in this report, due to incomplete or absent analysis. The most important of these were as follows: (1) Mother's recognition of severe acute respiratory infections, (2) Diarrhoea prevalence, oral rehydration and feeding, (3) Exclusive breastfeeding in young infants, (4) Mothers' place of delivery and type of attendant, (5) Literacy and education of the mother and (6) Birth interval . Further, details of key indicators according to important relationships such as nutritional status with diarrhoea, household size, birth interval and mother's literacy/education are not included.

[1] Permission for release of the results for the South/Centre was given on October 1, 1997.

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ACKNOWLEDGMENTS

The 1996 Multiple Indicator Cluster Survey (MICS) in Iraq was developed and supervised by the Maternal and Child Unit of the Central Statistical Organization (CSO) in Baghdad, now headed by Abdullah Hassan Mathi. The original planning team was composed of Nabil Zeki, Munther Abbas, Siham Abdul Hamid, Huda Heddawi and Dr. Mehdi Al-Ani. Abdullah Hassan Mathi and Munther Abbas were responsible for survey implementation and Huda Heddawi for analysis. Added training for nutritional assessment was provided by Khalil Muhssin, National Nutrition Research Institute, Ministry of Health, Baghdad.

The sample for the 1996 MICS in South-Central Iraq was designed by Dr. Mehdi Al-Ani, at that time, Director of the Department of Household Surveys, CSO and Dr. Caesar Victora (Federal University of Pelotas in Brazil). A modified sampling scheme was developed for the three Northern Autonomous Governorates and applied by Dr. Ashwaq Wardi and Dr. Basil Al-Hussaini (UNICEF/Iraq).

Preparations for the survey field work were made by the Maternal and Child Unit of the Central Statistical Organization (CSO), supported by UNICEF. These were based on experiences with the 1995 Multiple Indicator Cluster Survey, the MICS Handbook (UNICEF) and attendance at a UNICEF workshop at the MENA Regional Office in 1995.

Dr. Patricia David (Harvard School of Public Health, Boston, USA), reviewed the questionnaire, training program and procedures for implementation prior to the survey. Dr. A. Batieha (Jordan University of Science and Technology, Irbid, Jordan) reviewed the field work of survey teams.

Data from the South-Central region were entered by the Computing and Data Analysis Unit of the Central Statistical Organization, supervised by Bushra Abdul Jawad, who also did editing and began analysis, with preliminary tables. This was supported by Dr. M. Ulusoy (Haceteppe University, Ankara, Turkey), Dr. Basil Al-Hussaini and Nefise Bazoglu (UNICEF/MENARO).

Data from the Northern region were entered into computer files at the office of Tariq Ziad (local consultant), who also wrote the data entry program. These data were edited and analyzed by Dr. Ashwaq Wardi with Basil Al-Hussaini. Preliminary tables were prepared by Baath Al-Badri and Dr. B. Al-Hussaini at 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. In October 1997, Dr. A. Zerfas (Nutrition Consultant, UNICEF) help complete this report based on the analytic tabulations.

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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

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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)
Mahalla	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
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

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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 to meet the Mid-Decade Goals of the National Plan of Action for Children, drafted by the Government of Iraq after the World Summit for Children. The timing of the survey became appropriate to provide some baseline data against which the adequacy of the Security Council Resolutions 986/1111 could 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 report describes the planning and methods used for the whole of Iraq, with results pertaining to the 15 governorates in the South/Centre Region.

The indicators selected were those pertaining to health, nutrition, water/sanitation and education Mid-Decade Goals. The statistically valid sample in the South/Centre Region has 255 clusters and 6,375 households with 6392 children under five years of age. Each cluster averages 25 households. The design is multistage and stratified by urban/rural. Descriptions are possible by urban/rural and male/female, and by governorate.

Results

The nutritional situation in young children continues to be serious. About one third (or an estimated 960,000 children under five years of age) are chronically malnourished, with evidence of continuing major recent acute deterioration, based on high levels of acute malnutrition (11%). Comparison of the results for the September 1991 survey by an International Team indicates there has been a great increase in prevalence rates since that time - stunting 18% increased to 31%; underweight 9% to 26% and wasting 3% to 11%. Iraq has moved from a country in 1991 having a low prevalence of all three indicators (wasting, stunting and underweight) to high prevalence rates in 1996, matching the serious extent encountered in very needy countries of the world.

Most of the population (82%) has access to a water supply from a network, public tap or well, with an even higher percent (91%) with water nearby although water quality and quantity are unknown. About three-quarters (77%) have access to a flush system of sanitation ; this percent rises to 98% if a covered latrine is also included. However the appropriate means of controlling sewage was not investigated.

Most (84%) of 6-11 year olds were enrolled for primary school during the 1995-6 school year, although school entry for 6 year olds was lower (68%). The school gross enrollment rate for

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children aged 6-15 years was 73%. These data indicate that a substantial proportion of children (about one-quarter, depending on the definition used) are absent from school.

Immunization coverage for children have adequate reported levels based on reporting of children aged 12-23 months. These ranged from 73 to 80% for diphtheria/polio/tetanus (DPT3), OPV3 and measles, although some of the results may have been under-reported by respondents. Almost all children (97%) had BCG, this being a precursor for receipt of rations. About one-half of mothers (45%) had at least two doses of tetanus toxoid during their last pregnancy and a further 30% prior to that pregnancy.

Although almost all mothers ever breastfed their child, about 70% continued this practice during the first year, reducing to 64% early in the second year and to 25% by the end of the second year. Bottle feeding is used for every one in five infants. 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 was reported in about three-quarters (78%), although the frequency, amounts and quality of these foods are not known. Such 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. Only one in ten households where tests were done, had adequate iodine in their salt (equal or greater than 25ppm).

Comparisons by urban/rural: Rural prevalence rates are worse than urban for many indicators. This is especially marked for safe water access (50% rural vs 96% urban) and safe sanitation (34% vs 97%). Immunization rates (DPT3, OPV3, measles for children and tetanus toxoid for mothers) were some 10 to 15% lower in rural areas. Similar gaps occurred for receipt of Vitamin A, school enrolment and primary school entry.

Nutritional status prevalence was similar for urban/rural areas, despite the disparity in services and human resources. One important reason in this survey relates to better feeding practices for rural young children, another might be greater local food availability in rural areas.

Comparisons by sex: There were very few differences by sex for the indicator results and even these were marginal. One result of interest is the disparity in breastfeeding rates for children aged 12-15 months (70% male vs 57% female), although further analysis is required for statistical significance.

Comparisons by Governorates: Results are less precise than for the total country, due to a lower number of children assessed in each governorate (average of 420). This is further compounded for results describing short age ranges, such as feeding indicators of 4 months intervals.

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Differences are found in most of the indicators. With regards to malnutrition rates, wide ranges were found. The prevalence of wasting was over 10% in 11 of the 15 governorates, of stunting over 30% in 10, and of underweight over 20% in 11 of the governorates.

Water access from a network, public tap or well ranges from 64 to 99%, with as expected the major problems in the south, although the comparative availability, quantity and quality was not determined. Sanitation access to a flush system ranges from 46 to 98%, although this does not take into account the adequacy of sewage .

Primary school net enrolment rates varied from 70 to 95%, six year old entry from 42 to 95% and Gross enrollment rates (6-15 years) from 61 to 87%.

Immunization rates (apart from BCG) ranged for DPT3 from 49% to 96%; OPV3 from 38% to 97%; measles from 63% to 99%; and TT2+ during the last pregnancy from 21% to 84%. *Some of these differences may be due to methodological reasons.*

The percent of children still breastfeeding at 12-15 months ranged from 30 to 85%; and for 20-23 months from 11 to 43%. Although the onset of breastfeeding is almost universal, in some governorates about 10% of women never even started to breastfeed their child. Bottle feeding for infants 0-11 months of age varied from 11 to 36%, in most governorates at least one-in-five infants took the bottle in the last 24 hours.

The percent of children who received Vitamin A capsules ranged from 11% to 69% for children aged 0-23 months and 0 to 89% for those aged 24-59 months.

Salt iodization levels were low (0 to 19%) for almost all governorates.

Certain items could not be included in this report, due to incomplete or absent analysis. The most important of these were as follows: (1) Mother's recognition of severe acute respiratory infections, (2) Diarrhoea prevalence, oral rehydration and feeding, (3) Exclusive breastfeeding in young infants, (4) Mothers' place of delivery and type of attendant, (5) Literacy and education of the mother and (6) Birth interval. Further, details of key indicators according to important relationships such as nutritional status with diarrhoea, household size, birth interval and mother's literacy/education are not included.

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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 to reach the Mid-Decade Goals of the National Plan of Action for Children, drafted by the Government of Iraq after the World Summit for Children. The timing of the survey also provides some baseline data against which the adequacy of Security Council Resolutions 986/1111 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[2].

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[3] (see Annex I for more details).

[2] 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. No surveys including nutritional status have been done since that in 1991, apart from those in Baghdad during mid 1995 and 1996.

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

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In South/Central Iraq, a total of 255 clusters were randomly selected through multi-stage sampling., with 17 clusters per Governorate (12 in urban and 5 in rural). Each cluster had on average 25 households. The South/Central sample was a sub-sample of the 1993 Household Survey, conducted by CSO. Clusters were randomly selected in the second stage (i.e. within urban blocks or villages).

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
Minimal Sample size required for U5's			400

** CSO projections based on 1987 Census of Iraq. (Includes both South-Centre and North)*
***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[4]. This would allow limited 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.

[4] 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%.

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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)[5] - see Annex II for more details. The questions developed for the trial MICS 1995 survey[6] 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[7]. 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. 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 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.

Each governorate had two survey teams, composed of two CSO interviewers and a Ministry of Health representative[8]. 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.

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

[6] 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.

[7] 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

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

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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 with the respective supervisors, checked all forms. In a few clusters, 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.

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.

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RESULTS FOR SOUTH/CENTRE GOVERNORATES

Results are presented for each area of concern - first for the total sample in the South/Centre, followed by urban/rural and male/female comparisons, with a summary table. Major between governorate comparisons are included after this, with more details in Annex VII.

1. Malnutrition

Chronic malnutrition occurs in about one-third (32%) of children under five years of age in the South/Centre of Iraq and underweight in about one-quarter. The present underweight estimate of 23% is more than twice that of Jordan and Turkey (9-10%) and one-half more than Iran (16%[9]). These moderate and severely malnourished children include a substantial percent with severe malnutrition (chronic 13.5% and underweight 6.4%).

The nutrition problem has increased greatly since the onset of the sanctions *(see section on trends)* and remains serious, both for acute and chronic. The prevalence of acute malnutrition (11%) is high enough to suggest there is a continuing major recent deterioration at the time of the survey. Further, there are likely population pockets within the region with even higher levels of acute malnutrition.

Based on these results and with an estimated population of 3,000,000 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 - South/Centre Governorates MICS, 1996

Malnutrition type	Indicator	Total <-2SD*	Moderate <-2 to -3 SD*	Severe <-3SD*
General (Underweight)	Weight-for-Age	690,000	500,000	190,000
Chronic (Stunting)	Height-for-Age	960,000	555,000	405,000
Acute (Wasting)	Weight-for-Height	330,000		

**Between -2SD (standard deviations) and -3SD represents moderate and less than -3SD severe malnutrition. In the case of wasting, a level of -2SD is generally considered as moderate to severe (See box next page for explanation)*

The numbers used for planned screening depend on the anthropometric criteria. In the South/Centre governorates this has been based on low weight-for-age (underweight). Thus, according to the results of this survey, a total of about 500,000 children under five years of age

[9] All country rates for these and other indicators are quoted from The State of the World's Children, 1997 or The Progress of Nations, 1997

(or on average 30,000 per each governorate) would be potential beneficiaries for attention (including supplementary feeding) based on between -2 to -3 SD weight-for-age and a further 190,000 below -3SD for special attention, including therapeutic feeding. For screening with low weight-for-height (wasting), there would be some 330,000 potential beneficiaries Due to its acute nature, the prevalence of wasting will vary over time, being especially sensitive to acute infections such as diarrhoea and ARI.

Nutritional implications for the anthropometric indicators

Chronic malnutrition (or stunting) results in poor physical child growth, often accompanied by sub-standard capacity for development and education. It reflects the cumulated result 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.

Malnutrition by age: The pattern of malnutrition by age showed similar results to other recent surveys in Iraq[10], with the critical age at risk under two years. Levels of acute malnutrition (wasting) for children aged 6-23 months are greater than those aged 24-59 months[11].

Of even greater concern is the relatively high prevalence of wasting in children aged 0-5 months (*Figure 1*), suggesting that exclusive breastfeeding is seriously compromised. The prevalence of chronic malnutrition tends to increase with age, after peaking during the second year of life. This indicator cumulates with age, hence the process of stunting up to two years of age is more important than the extent at later ages.

[10] The survey in Primary Health Care Centres (April, 1997) and the MICS for the North are two examples

[11] Sampling accuracy is less than that for children aged from 0-59 months (i.e. under 5's). However the patterns describe the extent of differences sufficiently great to be of import.

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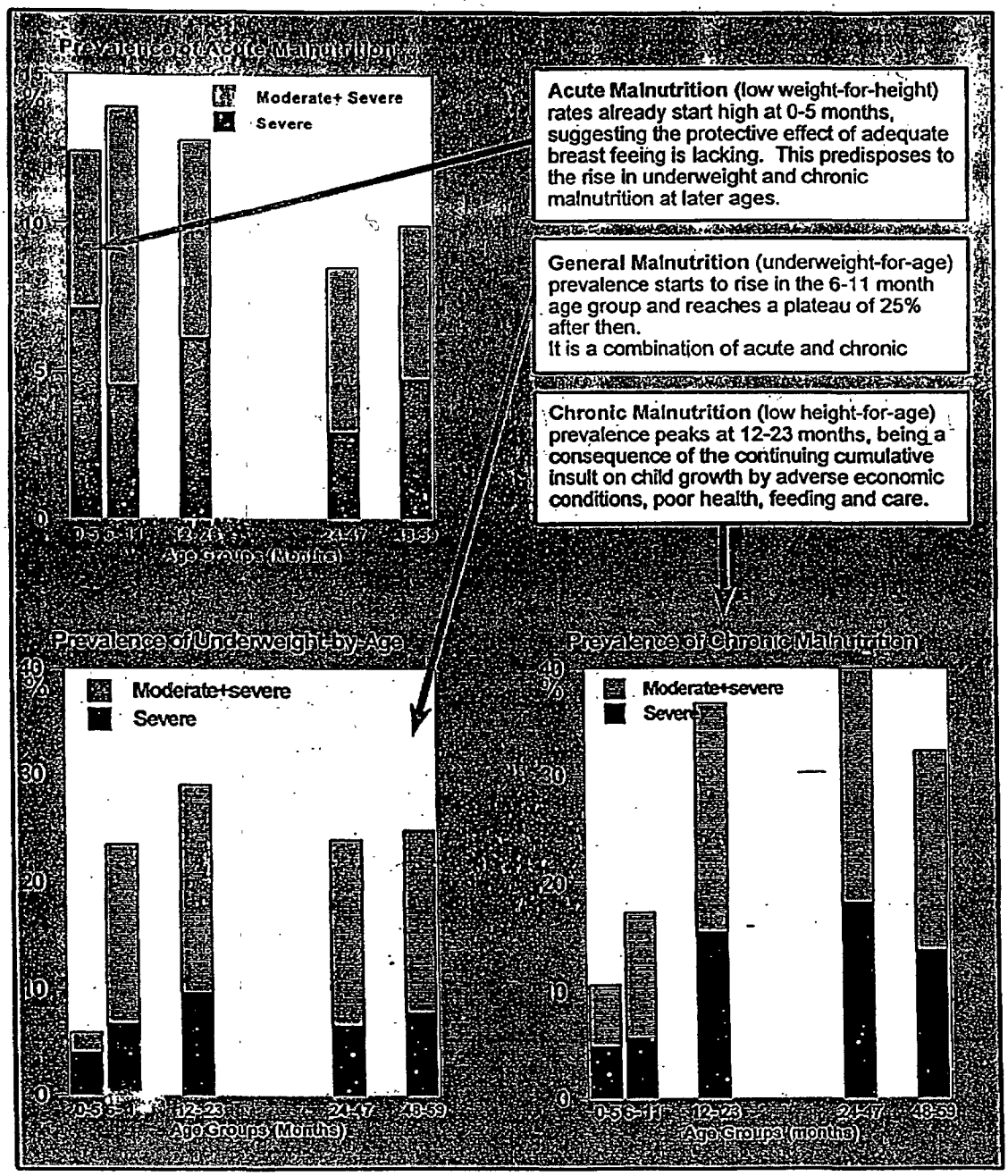
Figure 1

Malnutrition by Age Groups



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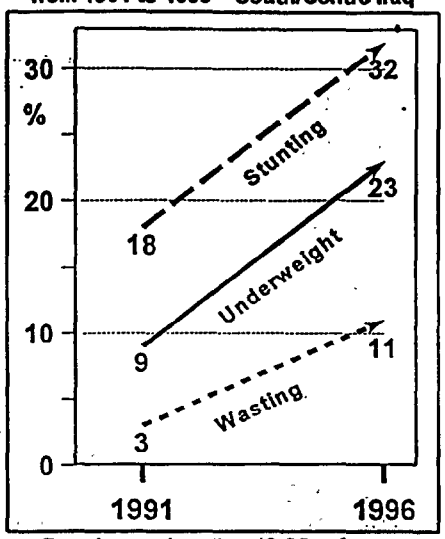
Trends: Comparison of the results for the August 1991 survey by the International Team indicates there has been a serious increase in prevalence rates since that time - stunting 18% increased to 31%; underweight 9% to 26%, and wasting 3% to 11% (1991 results listed first)[12]. The most striking increase has been with wasting (over 200%) - *Figure 2.*

Figure 2
Changes in Prevalence of Undernutrition from 1991 to 1996 - South/Centre Iraq



Prevalence - less than -2 SD reference
Household surveys in 1991 and 1996

Recently, a method to interpret the severity in the extent of malnutrition in young children has been proposed, according to prevalence rates[13]. In countries with low prevalence, malnutrition would not be considered an important problem, those with medium prevalence would have a problem of malnutrition and with high prevalence a serious problem.

Based on these criteria, Iraq has moved from a country in 1991 having a low prevalence of all three indicators (wasting, stunting and underweight) with malnutrition not an important problem to high prevalence rates in 1996, matching the serious extent encountered in the very needy countries of the world.

Further, there are important differences for regional changes in Iraq between 1991 and 1996. Results show a marked increase in prevalence in all regions of the South/Centre. (*Figure 3 on page 9*). Stunting is the prefered indicator for longer-term changes as it is the most stable.

It should be noted that the 1991 survey was done one year after the start of the sanctions, when the adverse effects on nutrition had already begun.

[12] Whereas the North started with a high prevalence of stunting (30%) and has remained high; the other regions have increased greatly in extent. Results for Wasit and Thiqar are not included in the comparisons as these governorates were not surveyed in 1991.

[13] Quoted in K. Sullivan trip report, Baghdad (January 1997)

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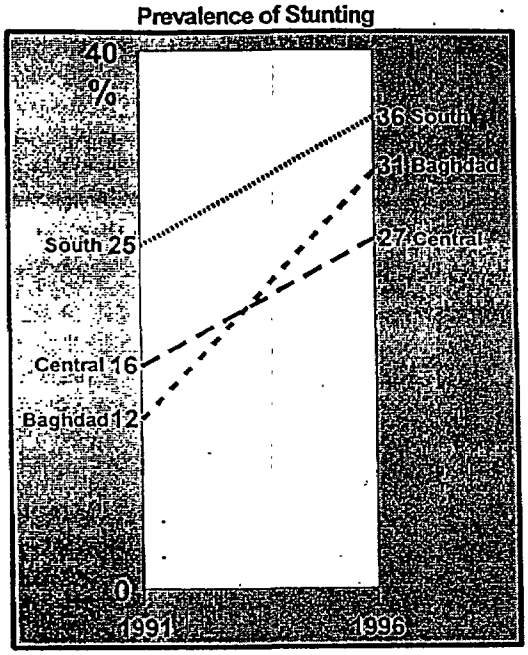
Figure 3

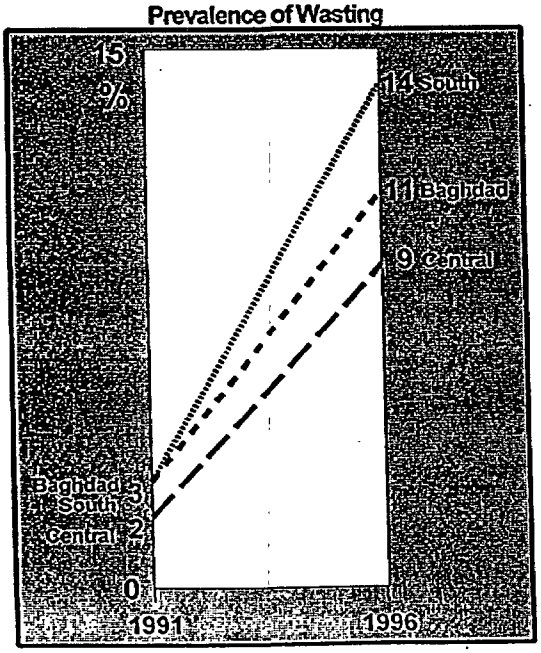
Changes in Nutrition Status - South/Centre Iraq (1991 to 1996)

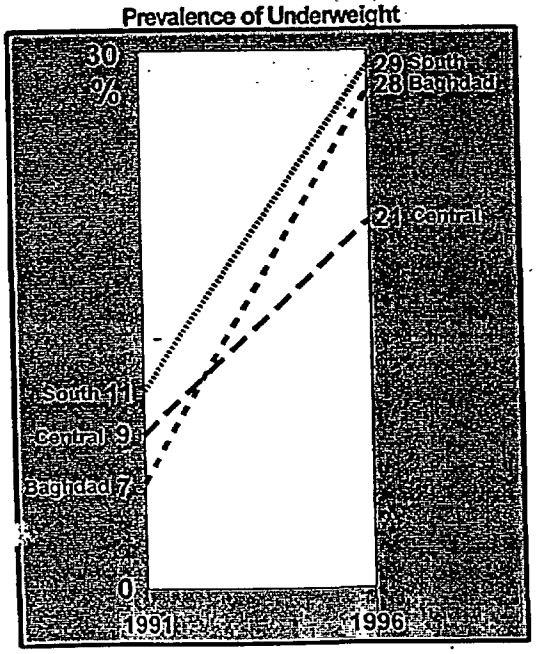


In September 1991 (about one year after the start of sanctions) a random sample of 2,676 Iraqi children under 5 years were measured for nutritional status. In September 1996 (five years later) a repeat random survey was conducted on 6,392 Iraqi children using the same procedures and analytic criteria (WHO reference data).

The change in nutrition is based on the 1991 designated areas of the country: Baghdad (urban and rural); Central (Anbar, Babil, Diala and Salahuddin) and South (Basrah, Kerbala, Missan, Muthana, Najaf and Qadissiyah). Wasit and Thiqar governorates could not be included as they were not surveyed in 1991.

Stunting (chronic malnutrition) is the most stable indicator over time. Results show a marked increase of prevalence in all regions of the South/Centre. Similar trends are noted for Wasting (acute malnutrition) and Underweight.





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2. Water and Sanitation

Most of the population[15] (81%) in the surveyed households have convenient access to a water supply from a network or other source such as a public tap or well, inside the home or within 100 metres. A nearby drinking water source of any kind was present in 91%. However, such findings do not take into account the quantity or quality of the water.

About three-quarters of the population (77%) have access to convenient flush to sewage system or flush to septic tank system, inside the home or within 50 metres). If a covered latrine is also included, then as much as 98% satisfied the criteria. However, the appropriate means of controlling sewage was not investigated. In addition, information was obtained from direct questioning, there being no systematic inspection of facilities.

3. School Attendance

Most children (84%) aged 6-11 years had attended school during the 1995-6 school year (net enrollment rate[16]). Somewhat less (68%) of children aged six had entered school in that year (primary school entry rate). According to a senior survey supervisor, positive responses indicated regular attendance. The "gross enrollment rate" is 73[17].

4. Immunization

Children: Immunization coverage for children by the time they reach 12-23 months of age is very high for BCG (98%) and intermediate for DPT3/OPV3 (73-74%) and measles (80%). 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 higher immunization rate for measles as compared with DPT3/OPV3, an unusual

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[15] In the analysis, population estimates were based on households, weighted for the average number in each household

[16] 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).

[17] 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. This is meant to reflect the proportion of older children who lag behind in education (denoted by a result over 100), but is difficult to interpret. However, it is likely that the result of 73% represents the percent of children 6-15 years enrolled in school.

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result, needs explaining. There was a successful activated measles immunization campaign conducted in December 1995, which would have contributed to the difference. 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. Further, mothers may have been confused by the recent introduction of polio vaccine combined with BCG at birth.

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

Mothers: Three-quarters (75%) of the mothers had received at least two doses of tetanus toxoid immunization prior to or during their last pregnancy[18] and almost one-half (44%) during their last pregnancy.

5. *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) could include high fever, difficult or rapid breathing, cough for more than 2 weeks, trouble eating, trouble sleeping, other and don't know.

The definition of appropriate intent is difficult or rapid breathing. It is unclear whether the analysis included other items also, hence the favourable result of 48% of all responses may be a gross over-estimate.

6. Breastfeeding

Ever breastfeeding in infants is almost universal (95%) with about two-thirds (64%) in children aged 12-15 months, suggesting by inference some 70% of women breastfeed their infants during the first year of life. One-quarter of mothers (25%) breastfeed their child to the end of the second year, that is for those 20-23 months of age.[19] [20]

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[18] The 75% is based on the sum of the two separate results - before (30%) and during (45%) after the last pregnancy. A more accurate estimate would be to analyse the combined responses for each mother.

[19] Because of the narrow age ranges for breastfeeding 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

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

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Exclusive breastfeeding (no added foo nor fluid nor water) was reported for infants aged up to four months, but the results need reviewing.[21] . This is based on the question relating to what was given to the child in the past 24 hours for those still breastfeeding, allowihg inultiple answers. 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: Three-quarters (77%) of children aged 6-9 months received complementary (solid/mushy) foods. This is below the level of 100% required for adequacy even not taking into account the quality, amount and frequency of such feeding. Results are based on the past 24 hours and not 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, (20%) during their first year. In the analysis, no distinction is made between those breast fed and those not. Bottle feeding 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.

7. Vitamin A supplementation

Slightly less than one-half (44%) of children under 2 years of age and more than one-half (55%) 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. In December 1995, Vitamin A supplementation was coupled to all children at 9 months of age with the National Measles Immunization Campaign. A second dose is given with the booster of DPT at 18 months, although the programme may not have had sufficient time to develop this fully. It is likely that many mothers were not sufficiently familiar with these linkages to recall the receipt of Vitamin A drops or capsules.

8. Iodized Salt

Only one in ten households had at least 25ppm of iodine in their salt as per the testing kit, a result which is unacceptable. This level was chosen as surveyors found it difficult to distinguish levels of 50ppm or greater. The testing was often closely checked by supervisors. The low results may be attributed to the fact that salt was not distributed at that time in the ration. However, the ration for 1997 will include the provision of iodised salt.

[21] 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. In surveys, mothers tend to overlook small amounts of fluids or water (which could be contaminated) given to the child, especially on hot days. This gives inflated results for exclusivity.

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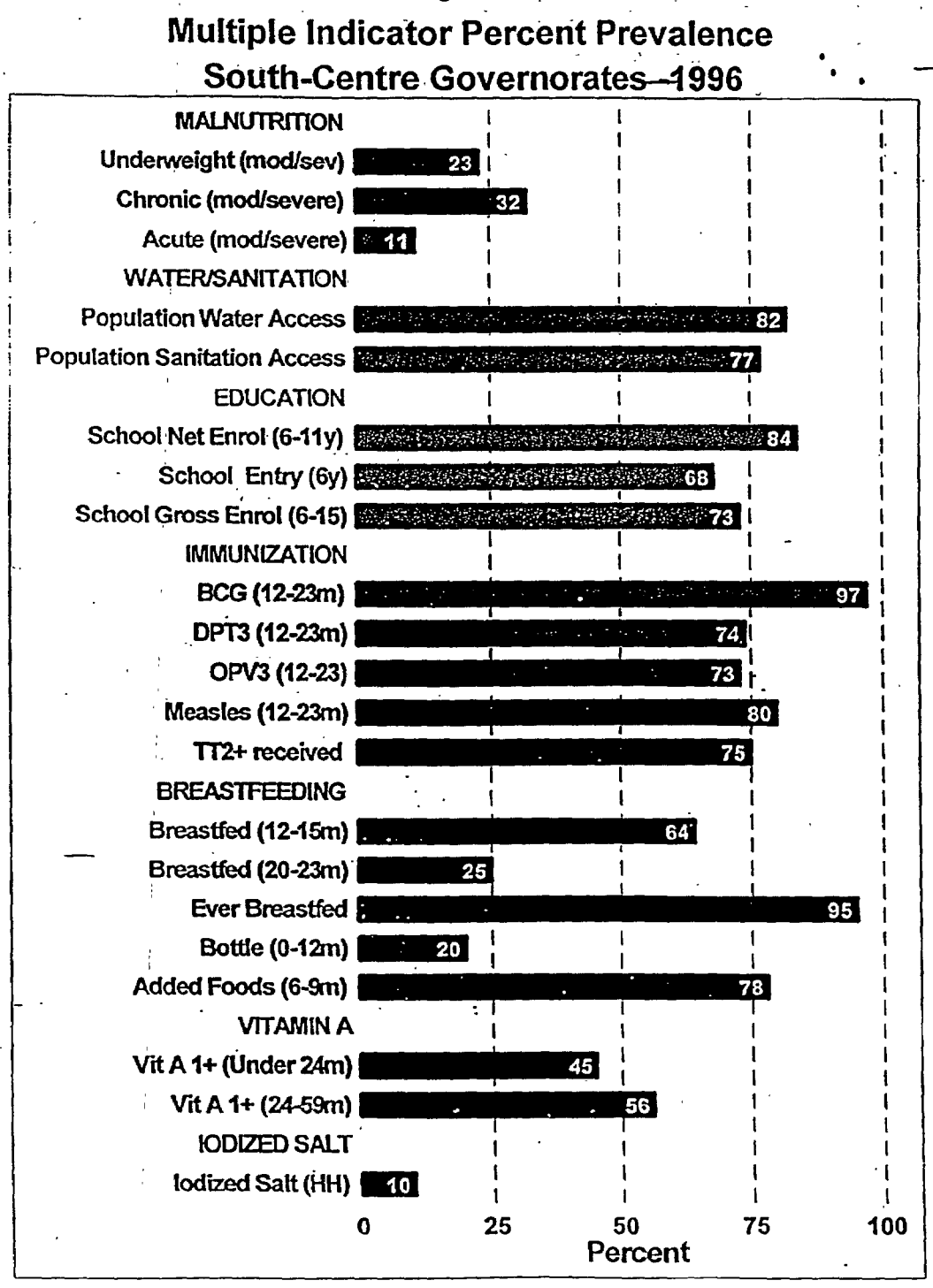
Figure 4



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9. Comparisons by Urban/rural

Rural prevalence rates are worse than urban for many indicators. This is especially marked for water access (50% rural vs 96% urban) and sanitation access (34% vs 97%). Other gaps are apparent for immunizations for DPT3, OPV3 and Measles (gaps of about 10%) in children and for tetanus toxoid in mothers (gap of 15%); receipt of Vitamin A (35% vs 51% for children aged under 2 years and 43% vs 64% for 2-5 years); school enrolment (gap of about 10%) and primary school entry (gap of 20%).

It is likely that water/sanitation, health and education services are less in rural as compared with urban areas. In addition human resources, such as mothers literacy are relatively low.

Nutritional status prevalence was similar for urban/rural areas. It is of interest that despite the disparity in services and human resources, all nutritional status indicators for the young child (underweight, chronic and acute) have almost the same results. One important reason in this survey relates to better feeding practices for rural young children. Over 10% more rural children had continued breastfeeding (32% vs 20%) in the second year[22]. Bottle feeding rates were less in rural areas (16% vs 22%) and early complementary feeding more prevalent (82% vs 75%).

Although not investigated in this survey, it is likely that local food availability in rural areas is in general better than urban areas. Furthermore, a standard basic ration to the whole population (urban and rural) would tend to even out any relative lack of purchasing power or opportunity in rural areas.

Another result similar between rural and urban areas was BCG immunization (95% rural vs 98% urban). BCG is essential to obtain birth ID for the child, needed for receipt of the government ration.

[22]On the other hand, breastfeeding at 12-15 months for rural and urban are similar (64%) and might suggest that certain benefits (such as economic) are appreciated in urban areas. A more reliable estimate for infant breastfeeding might be the percent of infants 0-5 months and 6-11 months who are breastfed.

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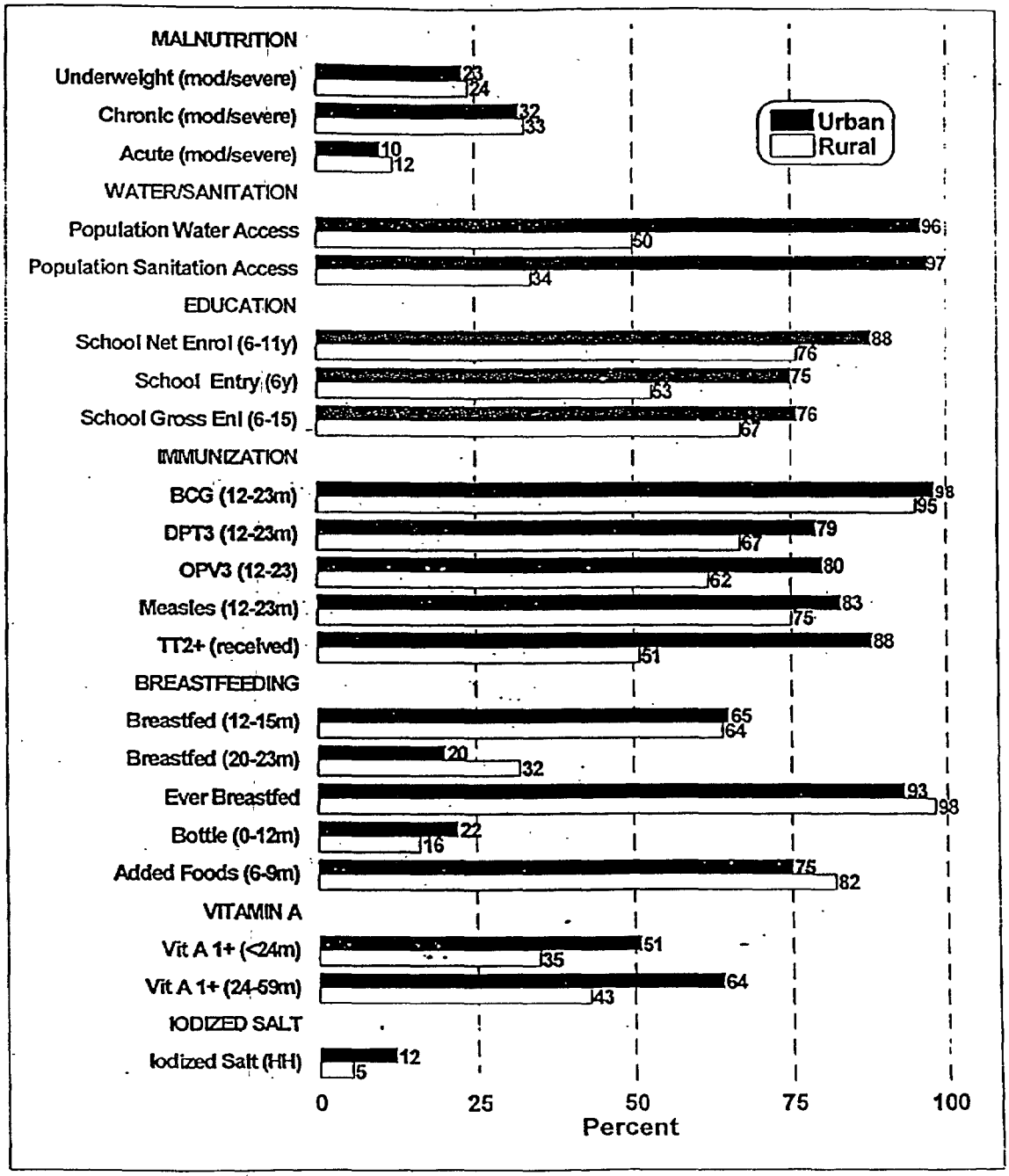
Figure 5

Comparison of results by Urban/Rural



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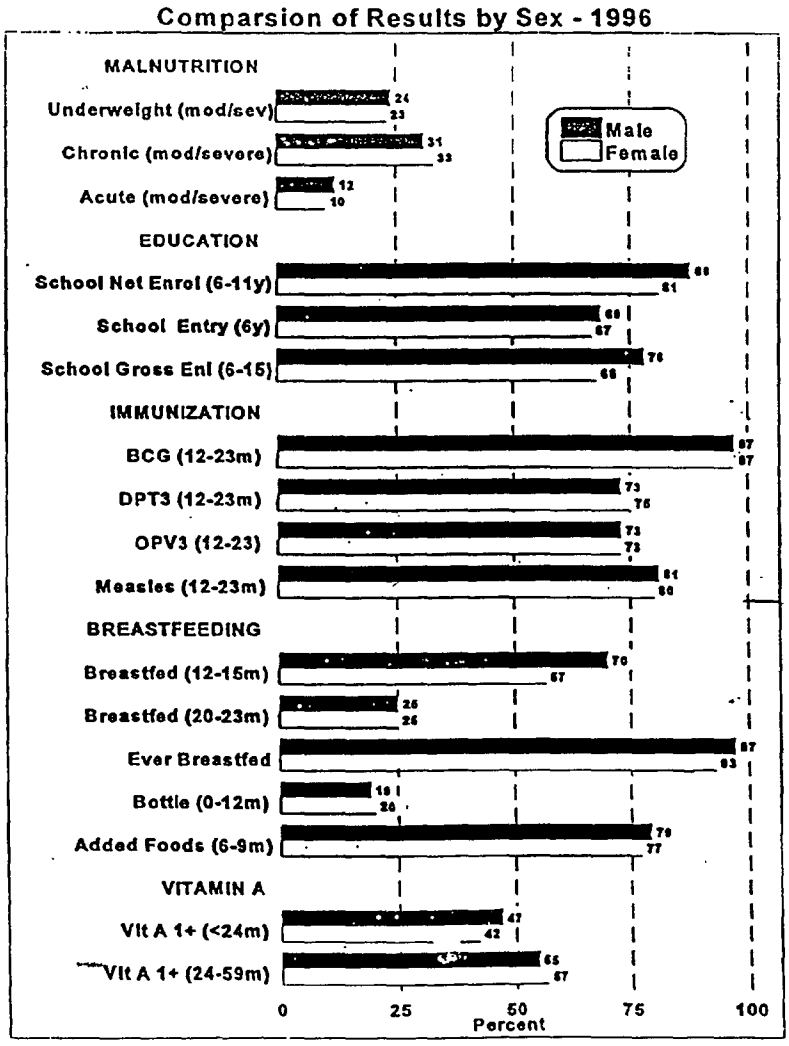
10. Comparisons by Sex

There were few differences by sex for the indicator results and even these were marginal (*Figure 6*). The small difference in chronic malnutrition prevalence (31% male vs 33% female) could be explained by chance in sampling; likewise for that in school net enrolment (87% male vs 81% female). School gross enrolment rates (77% male and 68% female) are difficult to interpret, being the ratio of the number of 6-15 year old children attending primary school divided by the total number of children aged 6-11 years. One result of interest is the disparity in breastfeeding rates for children aged 12-15 months (70% male vs 57% female). Due to the restricted age group and lower sample sizes, this might be explained by chance[23]

Figure 6



[23]Confidence intervals would be useful in analysis to clarify the statistical significance of the difference

UND309601410

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

Indicators	TOTAL	Urban/Rural		Sex	
		Urban	Rural	Male	Female
MALNUTRITION					
Underweight (mod/severe)	23.4	23.1	24.1	23.5	23.3
Chronic (mod/severe)	32.0	31.7	32.7	30.8	33.2
Acute (mod/severe)	11.0	10.2	11.7	11.7	10.3
WATER/SANITATION					
Population Water Access	81.7	96.2	49.8		
Household Water nearby	90.8	98.1	72.4		
Population Sanitation Access	77.1	96.7	33.7		
Sanitation Access incl. covered latrine	98.0	100.0	93.2		
EDUCATION					
School Net Enrol rate (6-11y)	84.4	88.3	76.3	87.5	81.0
School Entry rate (6y)	67.8	74.6	53.3	68.8	66.6
School Gross Enrol rate (6-15)	73.0	75.7	67.4	77.5	68.0
Mother's Literacy					
IMMUNIZATION					
BCG (12-23m)	97.0	98.0	95.3	96.9	97.0
DPT3 (12-23m)	74.0	78.5	66.7	72.9	75.1
OPV3 (12-23)	73.0	79.6	62.2	73.1	72.9
Measles (12-23m)	80.3	83.4	75.3	81.1	79.5
TetTox 2+ (before last pregnancy)	30.1	53.3	30.9		
TetTox 2+ (during last pregnancy)	44.7	35.3	19.7		
ACUTE RESPIRATORY INFECTIONS					
Know signs of ARI					
ORAL REHYDRATION AND FEEDING					
Diarrhoea (past 2 weeks)					
ORT/Fluids (past 2 weeks)					
ORT/fluid/food (past 2 weeks)					
BREASTFEEDING					
Breastfed (0-11 months)					
Breastfed (12-15 months)	64.2	64.6	63.6	70.1	56.6
Breastfed (20-23 months)	24.9	20.4	31.9	24.7	25.1
Exclusive (0-4 months)					
Ever Breastfed	94.9	93.1	97.8	96.7	93.1
Bottle (0-11 months)	19.7	22.3	15.7	19.3	20.2
Added Foods (6-9 months)	77.9	75.1	82.0	78.5	77.2
VITAMIN A					
Vit A 1+ (Under 24 months)	44.5	50.6	34.8	46.8	42.1
Vit A 1+ (24-59 months)	55.9	63.6	42.6	54.8	57.0
IODIZED SALT					
Iodized Salt over 25 ppm (HH)	9.9	12.0	4.6		

Items in blank boxes need analysis

UND309601411

13. Comparisons by Governorate[24] *(for more details, consult Table 4 and Addenda 2 and 3)*

Differences are found in most of the indicators. With regards to malnutrition rates, the prevalence of wasting was over 10% in 11 of the 15 governorates. Wide ranges were found for underweight (range 15 to 34%) and stunting (21 to 48%), although most governorates had relatively high rates..

Access to a water supply from a network, public tap or nearby well ranges from 64 to 99%, with as expected the major problems in the south. In almost all governorates at least 80% of the households are within a convenient distance (100 metres) from a water supply. However, the availability, quantity and quality was not determined. Sanitation access to a flush to sewage or septic tank ranges from 46 to 98%, although this does not take into account the adequacy of sewage . When covered latrines are also included, over 90% of households in each governorate satisfy this criterium.

Primary school net enrolment rates varied from 70 to 95%; six year old entry from 42 to 95% and gross enrollment rates (6-15 years) from 61 to 87%. There are major differences in school attendance between governorates with a similar pattern for each of the three indicators.

With regards to immunization, that for BCG was universally high - over 90% in all governorates. The others varied more: DPT3 - 49 to 96%; OPV3 38 to 97%; measles 63 to 99%; and TT2+ (during the last pregnancy) 21 to 84%. *Some of these differences may be due to methodology, especially with different teams in each governorate, is difficult to assess.*

The duration of breastfeeding ranged widely throughout the governorates, although lower sample sizes for the narrow age ranges make results relatively imprecise. The percent of children still breastfeeding at 12-15 months ranged from 30 to 85%; and for 20-23 months from 11 to 43%. The onset of breastfeeding is almost universal, but in some governorates about 10% of women never even started to breastfeed. Bottle feeding for infants aged 0-11 months varied from 11 to 36%, in most governorates at least one-in-five infants took the bottle in the last 24 hours.

The percent of children who received Vitamin A drops ranged from 11% to 69% for children aged 0-23 months and 0% to 89% for those aged 24-59 months. Part of these differences may be related to the timing and progression in each governorate. Also there may have been differences in the degree of the mother's understanding of the questions.

Salt iodization levels were low (0 to 19%) for almost all governorates; the only one approaching more acceptable levels was Anbar, although it is unclear why that governorate is so markedly different from the rest.

[24] 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

UND309601412

Figure 7

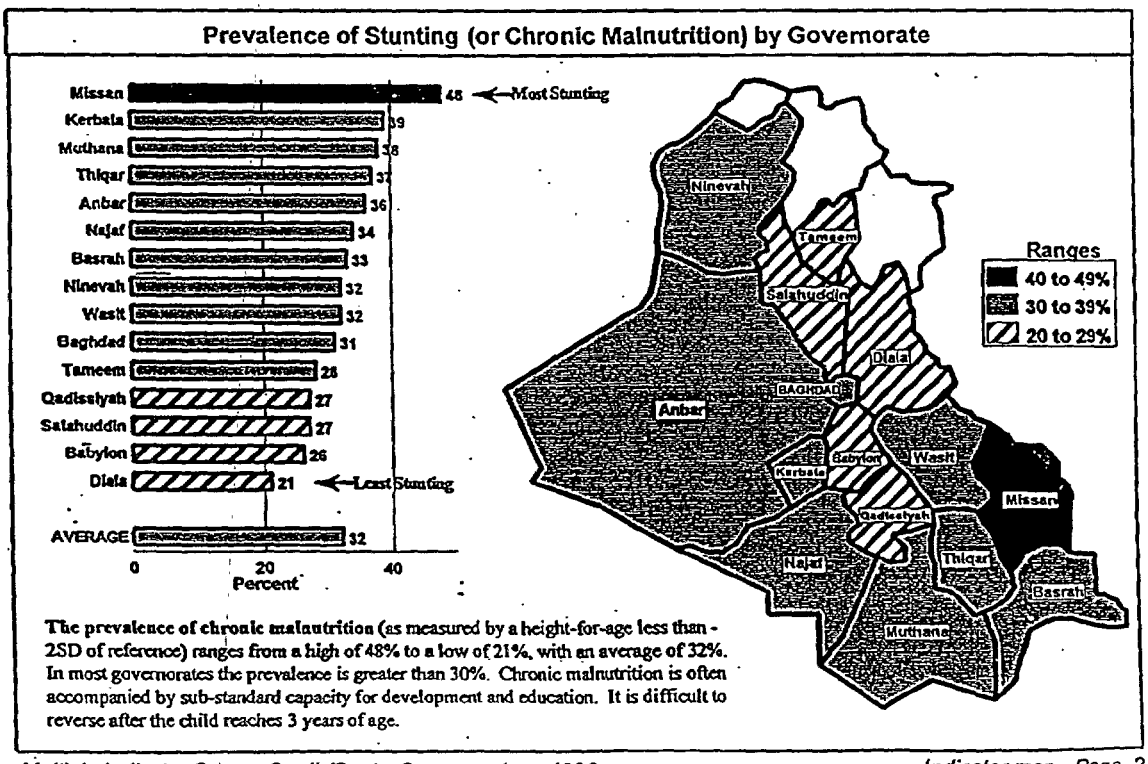
Prevalence of all indicators by each governorate

This is a series of a combination bar chart, map and text describing the results for each indicator. In this figure (includes pages 20-21) there are four combinations (Stunting, Measles Immunization, Water access and School Enrollment). A complete series is provided in Addendum 1.

In the example for the Prevalence of Stunting by Governorate:

The bar chart on the left ranks the results by governorate, with the greatest on the top (48%), the lowest on the bottom (21%), followed by the average (32%).

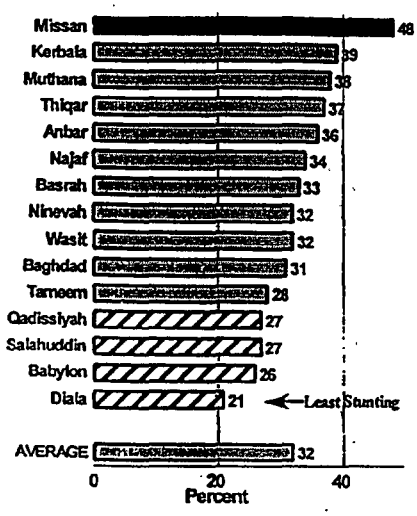
The map on the right uses the same patterns as the bar chart - shaded the most favourable and black the least, according to set levels; in this example the shaded pattern has a range of 20 to 29% and black of 40 to 49%.

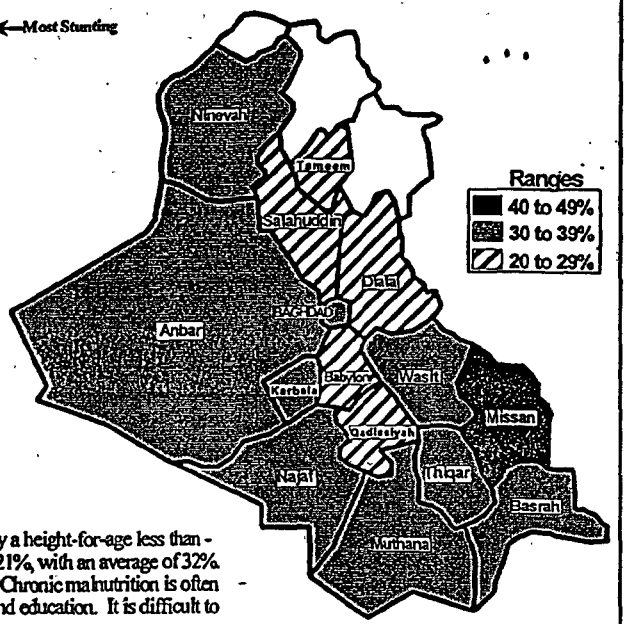


Multiple Indicator Survey South/Centre Governorates - 1996 *Indicator map - Page 2*

UNI309601413

Prevalence of Stunting (or Chronic Malnutrition) by Governorate

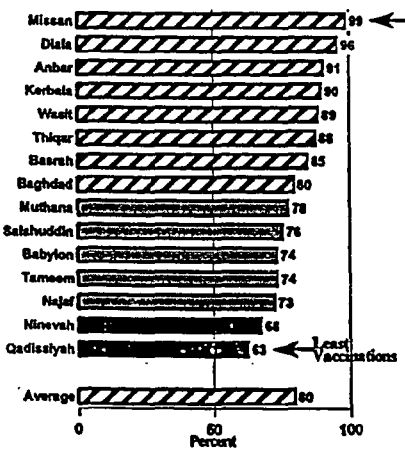


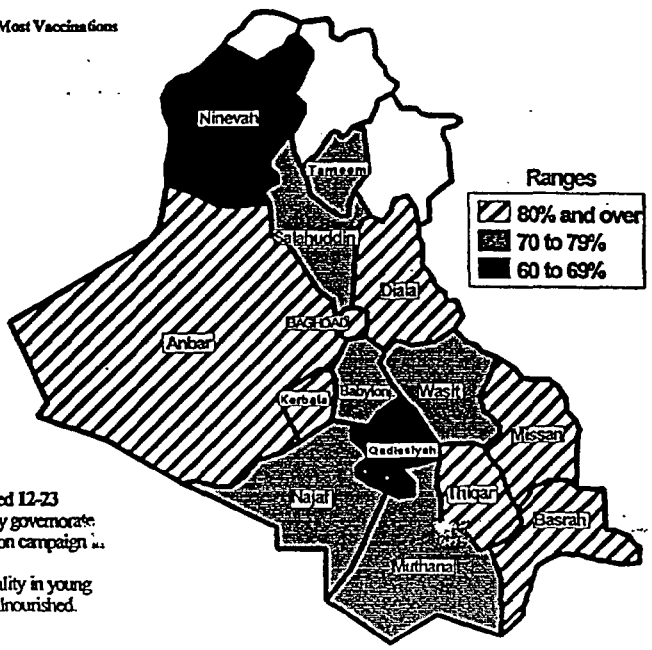


The prevalence of chronic malnutrition (as measured by a height-for-age less than -2SD of reference) ranges from a high of 48% to a low of 21%, with an average of 32%. In most governorates the prevalence is greater than 30%. Chronic malnutrition is often accompanied by sub-standard capacity for development and education. It is difficult to reverse after the child reaches 3 years of age.

Multiple Indicator Survey South/Centre Governorates - 1996 *Indicator map - Page 2*

Percent of Children aged 12-23 months who had Measles Immunization - by Governorate



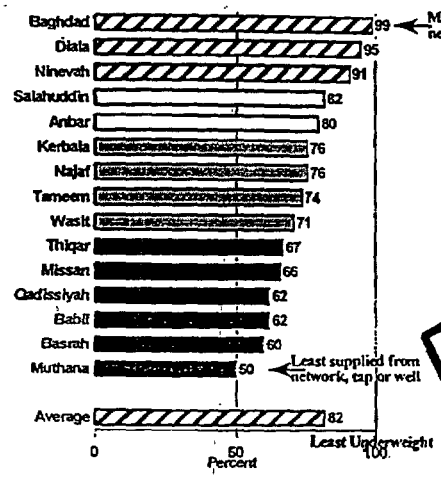


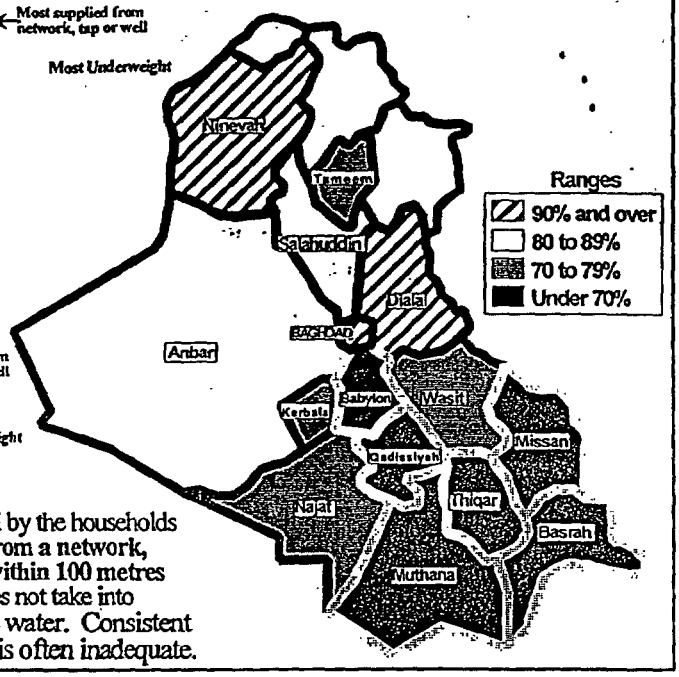
Immunization coverage for measles in children aged 12-23 months averaged 80% with a range of 63% to 99% by governorate. There was a successful activated measles immunization campaign in December 1995.
Measles is an important cause of morbidity and mortality in young children, being especially serious in those already malnourished.

Multiple Indicator Survey South/Centre Governorates - 1996 *Indicator map - Page 12*

UND309601414

Percent of population with water supply from a network, tap or well

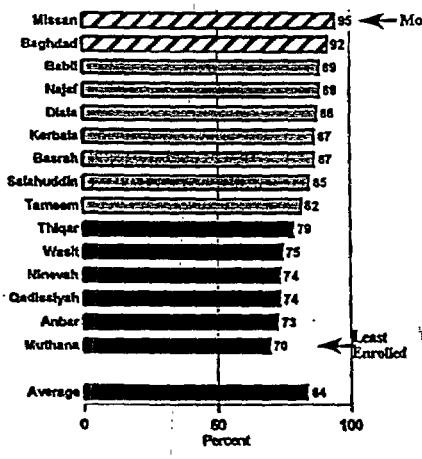


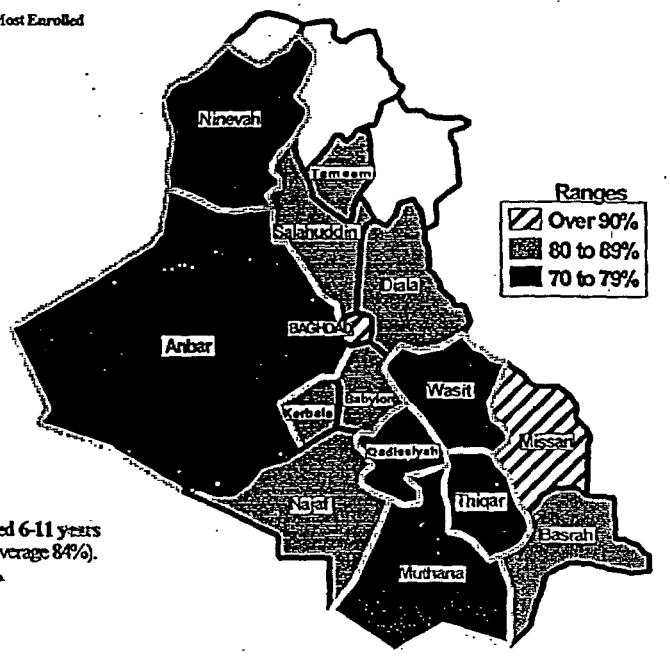


Most of the population (82%) represented by the households surveyed had access to a water supply from a network, public tap or well, inside the home or within 100 metres (range 50% to 99%). However, this does not take into account the quantity nor quality of the water. Consistent findings from water testing show this is often inadequate.

Multiple Indicator Survey South/Centre Governorates - 1996 *Indicator map - Page 4*

Percent of children 6-11 years enrolled in Primary School - by Governorate





Enrollment in Primary School by children aged 6-11 years for the 1995-6 school year was generally high (average 84%). The range by governorate was from 70% to 95%.

Multiple Indicator Survey South/Centre Governorates - 1996 *Indicator map - Page 6*

UNI30960141E

List of MICS Indicators:

The following are the indicators planned for the Multiple Indicator Survey in reference to decade goals. Those marked with an asterisk (*) have results included in this report.

1. MALNUTRITION
* 1 Percent of U5 who fall below (-2SD) from median Weight for Age.
* 2 Percent of U5 who fall below (-2SD) from median Height for Age.
* 3 Percent of U5 who fall below (-2SD) from median Weight for Height.
* 4 Percent of U5 who fall below (-3SD) from median Weight for Age.
* 5 Percent of U5 who fall below (-3SD) from median Height for Age.
  6 Percent of U5 who fall below (-3SD) from median Weight for Height.

2. WATER AND SANITATION:
* 1 Percent of population with access to safe water at convenient distance.
* 2 Percent of population with access to safe sanitation at convenient distance.

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

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

5. ACUTE RESPIRATORY INFECTION:
  1 Percent of mothers of U5 children who know the signs of ARI.

CDD:
  1 Percent of diarrhoea cases among U5 in two weeks before survey who received ORT and recommended home fluids (Pre-1993 definition).
  2 Percent of diarrhoea cases among U5 in one month before survey who received ORT and recommended home fluids (Pre-1993 definition).
  3 Percent of diarrhoea cases among U5 in two weeks before survey who received ORT and increased fluids and continued feeding (Post 1993 definition).
  4 Percent 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:
* 1 Percent of infants less than 12 months old ever breastfed.
* 2 Percent of infants less than 12 months old who received any food or drink from a bottle.
  3 Percent of infants less than 4 months old exclusively breastfed.
* 4 Percent of infants (12-15) months old still breastfed.
* 5 Percent of infants (20-23) months old still breastfed.

7. VITAMIN A:
* 1 Percent of U2 receiving Vitamin A supplementation.

8. SALT IODISATION:
* 1 Percent of households consuming adequately iodized salt.

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