

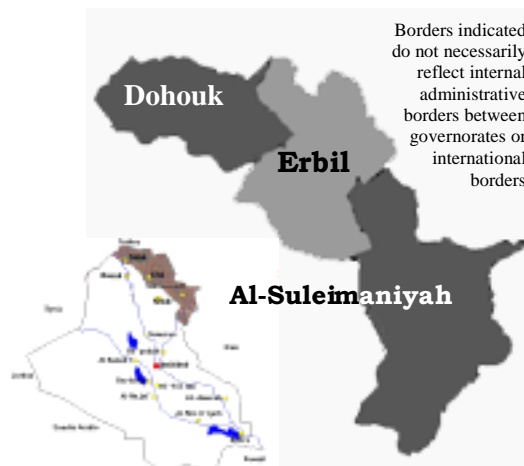
# Contents

<b>Chapter 1</b>	Introduction	<b>3</b>
<b>Chapter 2</b>	Survey Methodology	<b>4</b>
	Sample design and implementation	<b>4</b>
	Questionnaire design and pretest	<b>5</b>
	Data collection	<b>5</b>
	Field supervision and editing	<b>6</b>
	Response rates	<b>6</b>
	Data processing	<b>7</b>
<b>Chapter 3</b>	Respondent characteristics	<b>8</b>
<b>Chapter 4</b>	Child Mortality	<b>10</b>
	Data quality	<b>12</b>

## Chapter 1

### Introduction

Child mortality is a critical measure of the well being of children. Immediately after the gulf conflict an International Study Team carried out an extensive Iraq-wide mortality and nutrition survey. However, since 1991 there has been no countrywide child and maternal mortality survey, and the subsequent mortality level has been the source of considerable speculation over the last few years.



Recent nutritional status surveys in the autonomous governorates of Dohouk, Erbil and Al-Suleimaniyah have shown a steady improvement. The prevalence of underweight has declined to almost half the level it was in 1994. Considering the close association between malnutrition and mortality rates, the mortality level is also likely to have decreased.

The purpose of the 1999 Child and Maternal Mortality Survey in the autonomous governorates is to measure the levels and trends of child mortality over the past 20 years, by place of residence and by other key population characteristics. The survey complements the survey of child and maternal mortality undertaken in the fifteen governorates of the south and center of Iraq during the same period. Considerable care has been taken at every stage in the design and implementation of this survey so that it can produce high quality estimates of mortality. An international consultant has been involved in all stages of the survey, and the results in this report have also received critical scrutiny from a group of survey and mortality experts.

This Survey is the result of a partnership between the local authorities in the three autonomous governorates of Dohouk, Erbil and Al-Suleimaniyah and UNICEF. It has also been supported by WHO through the provision of technical expertise in reviewing the survey methodology and results. This preliminary report presents the first findings from the survey, and will be followed by a more comprehensive report after further analysis of the data.

The data on maternal mortality needs more analysis and will be presented in the full report, as will data on causes of child deaths.

## Chapter 2

# Survey Methodology

This chapter gives a brief account of the methodology used to carry out the survey. It includes: the sample design and its implementation, questionnaire design and pretest, data collection, field supervision and editing, response rates and data processing.

### Sample design and implementation

The survey of child and maternal mortality in the three autonomous governorates was regarded as part of an overall survey of child and maternal mortality in Iraq. The other fifteen governorates of Iraq were covered by a separate but similar survey undertaken during the same period.

The sample for this survey was designed to provide representative estimates of child mortality by place of residence and by key background characteristics (sex of the child and education of the mother). Taking these requirements into account a sample size of 16,000 households was arrived at for this survey.

Since 1987 there was no population census conducted in the three governorates. The sample frame, therefore, was based on the 1997 survey conducted by the Directorate of Reconstruction and Development (DRD) and UNICEF. The DRD-UNICEF 1997 survey covered all three governorates and resulted in population figures by governorate, district and sub-district. The sample design was based on this frame. All 23 districts were selected (six in Dohouk, six in Erbil and eleven in Al-Suleimaniyah). A three-stage stratified design was adopted in each district. The first stage of sampling selected two sub-districts from each district by probability proportion-to-population size (PPS). However where a district had less than four subdistricts, only one sub-district PPS was selected. Each selected sub-district was stratified into urban and rural parts and these divided into clusters (Majal) of households. At the second stage, clusters were selected by simple random sampling.

Within each selected cluster, 15 households were selected from the address list created by the DRD-UNICEF 1997 survey using systematic random sampling. All eligible women (ever married women aged 15-49 years) were identified during the household interviews and selected for inclusion in the sample.

## Questionnaire design and pretest

The questionnaire was aimed at obtaining data on infant and under-five mortality, and little additional information was collected beyond that needed to derive the mortality estimates. The questionnaire drew upon worldwide experience of deriving mortality estimates, by using relevant parts of the Demographic and Health Survey (DHS) core questionnaire and the DHS maternal mortality module. The survey questionnaire has six sections

- Household basic information
- Respondent's basic social characteristics
- Respondent's demographic characteristics
- Respondent's reproductive history (full birth history)
- Cause of death for children who died after January 1991
- Maternal mortality module (direct sisterhood method)

The standard DHS child mortality module was used without modification. As in the south and center of Iraq the maternal mortality module was modified to limit the data collected for male siblings.

The same questionnaire adopted in the fifteen governorates of south and centre was used. The questionnaires were pre-tested in each of the three governorates to ensure that the questions were well understood by interviewers and respondents. All interviewers and supervisors had a good command over Arabic and English and, therefore, it was not necessary to translate the questionnaire from Arabic to Kurdish. However, technical terms were translated and interpreted in Kurdish to enable interviewers to explain questions to respondents if the need arose.

## Data Collection

The organization of the survey was the joint responsibility of Directorates of Health and the Directorates of Statistics in the three governorates. Focal persons were identified in these organizations to coordinate the work. A total of two training sessions were conducted. The first session was for the core trainers from the three governorates and consisted of a three-day intensive training including field testing of the questionnaires at a central location in Erbil. Thereafter, training of supervisors and interviewers was conducted in the three governorates simultaneously. In order to ensure the quality of training and raise understanding of the questionnaire by interviewers, each governorate had three batches of interviewers and supervisors training. All interviewers were trained in administering the questionnaire and accurately reflecting the responses. An additional one day training was given exclusively for supervisors on quality control, supervision procedures as well as on flow of questionnaires from the field to governorate headquarters and from there to the place of data entry. Three manuals including supervisors', interviewers' and editing & coding manuals developed in Arabic and applied in south and centre were used. This helped the survey work to maintain uniformity of purpose and consistency of methodology with that of the south/centre.

Fieldwork began on April 22<sup>nd</sup>, 1999 in Erbil and Al-Suleimaniyah governorates and on April 24<sup>th</sup>, 1999 in Dohouk governorate and completed on May 12<sup>th</sup>, 1999. Of the 168 interviewers, 80% were female, all interviewers were trained health personnel, and each interview team had at least one female member. There were 48 supervisors, eleven of whom were UNICEF staff members.

## Field supervision and editing

Considerable care was taken in trying to achieve a high response rate and obtain quality data. The data collection process was supervised at three levels, the district, governorate and central level. The district level supervisors did not make any changes to the questionnaire, but were responsible for ensuring that all sample households were contacted, all eligible women interviewed, and responses completed for all relevant mortality questions.

The governorate supervisor again checked sample household coverage and the questionnaires and also carried out several checks on the internal consistency of responses.

In order to monitor changes to the original questionnaire responses, the interviewers had to enter responses in ballpoint. This is an unusual step since most surveys in Iraq use pencil for recording responses, but was agreed to so that any subsequent change would be obvious. Any such change had to be initiated by the field staff making the change.

Governorate supervisors passed on the completed questionnaires to the central office in Erbil for the final editing and recording of open-ended questions (such as the cause of death for children) before data entry.

## Response rates

Table 1 provides a summary of the response rates of the survey. From among the 15,942 households, a total of 14,035 eligible women were interviewed.

**Table 1: Results of household and individual interviews,  
Dohouk, Erbil and Al-Suleimaniyah governorates, 1999**

	Number	Response rate (%)
<b>Households</b>		
Selected	16499	
Interviewed	15942	96.6
<b>Eligible women</b>		
Identified	14064	
Interviewed	14035	99.8

The intensive field supervision and editing, household call-backs, short questionnaire, and well-organized training and field operations all contributed to the very high response rate.

## Data processing

After the final edit in Erbil, the questionnaires were entered onto computer using an entry program developed with EPI-INFO version 6.

Two distinct phases of machine data editing were implemented: during data entry and after data entry. During data entry, editing of data was restricted to the structure of the data file, questionnaire skip patterns, and the range of valid values for each data field. Special codes were used to identify any missing data in the questionnaire. The data entry operation was observed by an international consultant throughout the entire process.

After the data entry the separate files produced by each of the fifteen data entry staff were checked to look for records that had been updated by the staff during data entry.

After merging all the files, frequencies of the various identification variables were produced in order to identify duplicates. The necessary corrective measures were then undertaken. Further analysis consisted of production of the marginals for all the variables in the files to detect omissions and displacement of data. The interview records were stored at UNICEF's office in Erbil and were referred to in order to settle any anomalies found in the data set.

Analysis was done mainly using the SPSS programme package, with support from other statistical software such as Dbase and EPI- INFO.



UNICEF, Iraq

## Chapter 3

### Respondent Characteristics

The main focus of the Child and Maternal Survey in the autonomous governorates of Dohouk, Erbil and Al-Suleimaniyah was to estimate infant and under-five mortality. However, a small number of background characteristics of eligible women were collected and are reported here.

**Table 2: Percent distribution of ever-married women aged 15-49, by selected background characteristics, Dohouk, Erbil and Al-Suleimaniyah governorates, 1999**

Background characteristics	%
Place of residence	
Urban	84.1
Rural	15.9
Schooling	
Never attended	57.2
Primary	31.0
Intermediate	4.4
Secondary	3.8
University or higher	3.5
Current age	
15-19	6.5
20-24	17.0
25-29	21.1
30-34	16.7
35-39	13.9
40-44	13.7
45-49	11.2
Mean current age (years)	32.0
Marital status	
Currently married	94.6
Widowed	4.9
Divorced	0.2
Separated	0.3
Overall (%)	100.0
Number of women	14,035

Table 2 shows the distribution, in percent, of respondents by place of residence, schooling, current age, and marital status. Overall, more than four-fifths of the respondents live in urban areas and less than one-fifth in rural areas.

The majority of respondents have either never attended school, or attended only primary school. The majority of respondents are aged 25-39 (51.7 percent), 6.5 percent are 15-19, and around 11 percent are 45-49. About 95 percent of the ever-married women in the sample are currently married, and widows comprise the majority of the remaining 5 percent. As is typical in the Middle East region, a high proportion (47 percent) of marriages are to a cousin or other relative.



UNICEF, Iraq



## Chapter 4

### Child Mortality

The birth history section of the survey questionnaire is the source for data used to derive the mortality estimates presented in this section. Mortality rates are estimated directly from the information in the birth history on a child's birth date, survivorship status and the age at death reported for children who died. The following rates are used to assess child mortality.

#### Infant mortality rate

the probability of dying between birth and exact age one year

#### Under-five mortality rate

the probability of dying between birth and exact age five

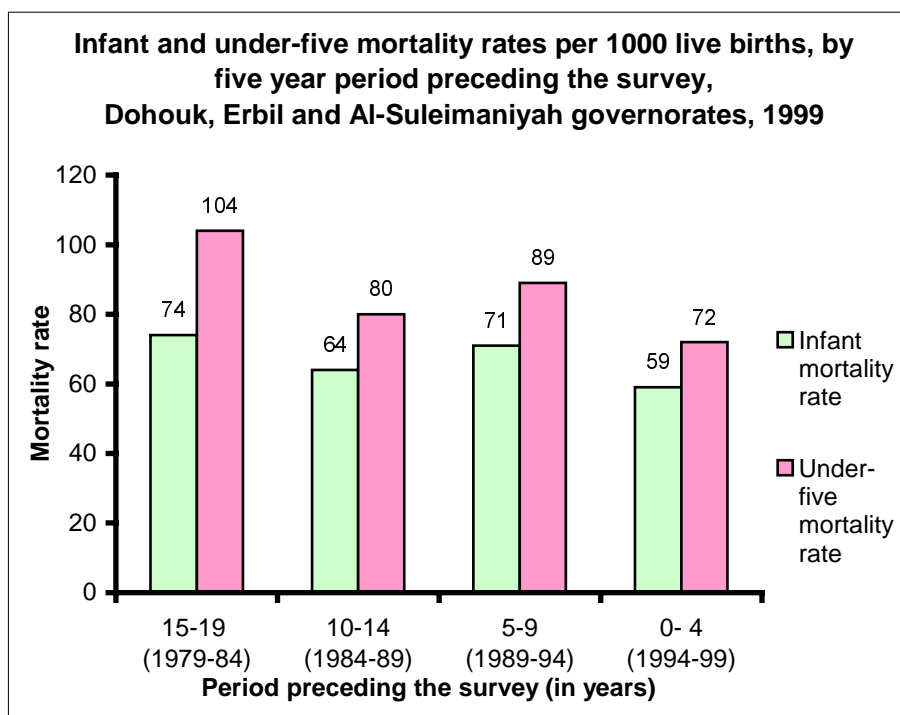
**Table 3: Infant and under-five mortality rates per 1000 live births, by five-year period preceding the survey, Dohouk, Erbil and Al-Suleimaniyah governorates, 1999**

Period preceding survey (in years)		Infant mortality rate ( <sub>1</sub> q <sub>0</sub> )	Under-five mortality rate ( <sub>5</sub> q <sub>0</sub> )
0-4	(1994-1999)	58.7	71.8
5-9	(1989-1994)	71.5	89.5
<b>10-14</b>	<b>(1984-1989)</b>	<b>63.9</b>	<b>80.2</b>
15-19	(1979-1984)	73.8	104.4

Table 3 presents child mortality rates for the 20 years preceding the survey. The table indicates that both the infant mortality rate (IMR) and the under-five mortality rate (U5MR) have fallen over the 20-year period. However both rates rose in the period 1989-94 (5-9 years preceding the survey).

More specifically the results show a decline in under-five mortality from 80 deaths per 1000 live births in the period from 1984 to 1989, to 72 deaths per 1000 live births in 1994-99. Similarly infant mortality fell from 64 deaths per 1000 live births to 59 deaths per 1000 live births over the same period. The survey did find that the decline was not continuous, and that infant and under-five mortality increased in the period 1989 to 1994.

These results show a decrease of a third for under-five mortality and a decrease of about a fifth for infant mortality over a twenty-year time span.



**Table 4: Infant and under-five mortality rates per 1000 live births, by background characteristics for the last five-year period, Dohouk, Erbil and Al-Suleimaniyah governorates, 1999**

Background characteristics	Infant mortality rate (1q0)	Under-five mortality rate (5q0)
<b>Place of residence</b>		
Urban	55.6	67.8
Rural	71.8	88.5
Dohouk	68.3	82.4
Erbil	60.3	74.9
Al-Suleimaniyah	48.1	59.1
<b>Schooling</b>		
Never attended	64.1	79.3
Primary	53.1	64.8
Intermediate/higher	*	*
<b>Sex of the child</b>		
Male	62.3	76.0
Female	54.9	67.4
<b>Overall</b>	<b>58.7</b>	<b>71.8</b>
* insufficient number of children		

Table 4 shows IMR and U5MR rates, for the most recent five-year period, by place of residence, schooling of mother and sex of the child. Children living in rural areas currently have a higher under-five mortality rate, at 89 deaths per 1000 live births, compared to those living in urban areas, where

the rate was 68 deaths per 1000 live births. As was found in the rest of Iraq, the current rate of mortality for female children was lower than that for males: 67 deaths per 1000 live births compared to 76 deaths per 1000 live births. Respondents with low levels of education have children with higher mortality rates than those with high levels of education, a situation found in many other countries. Mortality rates were highest in Dohouk governorate (infant mortality rate of 68 per 1000 live births and under-five mortality rate of 82 per 1000 live births) and lowest in Al-Suleimaniyah (48 and 59 respectively).

## Data Quality

A retrospective birth history, such as that included in this survey, is susceptible to several possible data collection errors. First, only surviving ever-married women aged 15-49 years were interviewed; therefore, no data were available for children of women who died. The resulting mortality estimates will be biased if the fertility of surviving women and non-surviving women differ substantially. In Iraq, this bias is likely to be very small or negligible.

Missing birth dates can bias results, particularly if the missing birth dates are for women with lower education and hence higher child mortality. However, reporting of both year and month of birth is very high in the survey, as can be seen from table 5. One of the reasons for these high levels of reporting is likely to be the ration cards kept by every household, in which the birth date of every person in the household is given.

A commonly observed error in survey data, especially by older women, is the omission of children ever born or those who died. If average parity by women aged 45-49 is lower than that of women 40-44 and there is no (historical) reason for this, it is probably because of omission of live births by the former. This pattern is generally because the births to older women involve a prolonged recall period, and that their infants and children might have experienced excessive mortality, making it difficult to remember the number of all births. The selective omission of births and deaths, by age of women was evaluated from the survey data and no evidence was found to suggest a greater omission of live births or of dead children by calendar year or sex.

The sex ratio of living and dead children by calendar year of birth was also examined, but no major selective omissions were found (see table 5).

More serious and complex errors in timing occur from the systematic displacement of birth dates by the mother nearer to, or further from, the time of the survey. Systematic errors in dating births have a characteristic pattern, concentrating births in the period 5-14 years before the survey, at the expense of births in earlier periods, and perhaps even from the most recent five-year period. A number of checks of the survey data were made, but no evidence for such displacement errors was found.

**Table 5: Distribution of births by calendar years for living, dead, and all children, according to both month and year reported and sex ratio, Dohouk, Erbil and Al-Suleimaniyah governorates, 1999**

Year	Percentage with complete birth date <sup>1</sup>			Sex ratio at birth <sup>2</sup>		
	Living	Dead	All	Living	Dead	All
1999	99.7	75.3	98.3	**	**	**
1998	99.6	95.9	99.5	109.5	149.3	111.3
1997	99.6	93.3	99.3	103.6	126.0	104.6
1996	99.6	95.3	99.4	103.6	102.4	103.5
1995	99.6	95.3	99.3	102.2	100.0	102.0
1994	99.5	95.7	99.2	113.3	135.2	114.8
1993	99.7	91.8	99.2	103.9	124.1	105.1
1992	99.5	95.5	99.1	102.9	145.6	105.8
1991	99.5	94.3	98.9	104.8	99.4	104.2
1990	99.4	93.4	98.8	101.5	131.0	104.2
1989	99.6	91.3	98.9	109.6	132.1	111.3
1988	99.5	90.3	98.7	104.6	121.4	106.0
1987	99.5	90.0	98.7	100.4	94.7	99.9
1986	99.3	92.3	98.7	100.6	103.7	100.8
1985	99.3	91.1	98.6	101.9	117.5	103.3
1984	99.2	89.9	98.2	106.4	85.7	104.2
1983	99.3	92.1	98.6	108.1	119.2	109.1
1982	99.2	89.5	98.1	102.9	132.7	105.8
1981	98.8	93.1	98.3	100.3	152.0	104.4
1980	98.0	95.5	97.7	117.0	106.7	115.6
Before 1980	96.5	97.6	91.9	103.5	112.9	105.2
Overall				<b>104.7</b>	<b>116.4</b>	<b>105.9</b>
Number of births	<b>57692</b>	<b>6545</b>	<b>64237</b>			

<sup>1</sup> Both year and month of birth

<sup>2</sup> Number of males per 100 females

\*\* Survey conducted in April, therefore incomplete data for 1999

Mortality estimates are based only on those births reported by ever-married women of reproductive age at the time of the survey, and these are truncated because women past age 49 are not interviewed. As the time period extends further into the past, the resulting censoring of information becomes progressively more severe. Therefore, results presented for more than 15 years before the survey should be interpreted with caution.

Of the 64,237 births, year of birth was reported for all births, but month of birth was missing for 1.6 percent of births. Imputation of the month of birth was undertaken by following standard procedures. In order to examine the effect of imputation, analyses were performed both on imputed and unimputed data. A comparison of the two showed no substantial difference between the two sets of estimates.