

Review of Potential Interventions to Reduce Child Mortality in Iraq

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 **BASICS II**



Summary

Child health in Iraq has suffered over two turbulent decades. Compared to other countries in the region, the status of child health in Iraq was reasonably good in the 1970s and 1980s. By the time of the Gulf War of 1991, however, there was a dramatic decline in child health, including a precipitous rise in infant and childhood mortality rates, an increase in levels of malnutrition, and a decrease in the provision and appropriateness of care for common childhood diseases. Four years after the initiation of the Oil for Food Program in 1997, improvements occurred, but child health in the country was still far worse than it had been in 1990.

An anticipated humanitarian crisis did not arise following the 2003 war, but substantial disruptions to an already fragile health system ensued. Preventive and primary health care services are limited in both access and quality. An historic opportunity now exists to make rapid, measurable progress in child health.

This report identifies programmatic interventions that can reduce infant and childhood mortality rates up to 50% within 12–18 months. These include:

- aggressive promotion of **exclusive breastfeeding** for the first 4-6 months of life
- improved **care of the newborn** at the time of delivery, including resuscitation, prevention of hypothermia, and antibiotics when necessary
- **oral rehydration therapy** for all cases of diarrhea, at home and at primary health care facilities
- continued **nutritional supplementation**, maternal education, and provision of Vitamin A and zinc
- measles and other **vaccinations**
- **domestic hygiene promotion**, including hand washing before meals and prior to defecation, safe water storage, and household water purification
- appropriate administration and prescription of **antibiotics**, especially for pneumonia, at primary health care facilities

Each of the above interventions should be divided into steps, some of which can be implemented immediately and others that will require preparatory work. The time between implementation of these steps and the appearance of measurable impact on child health status will vary.

Intervention effects should be cumulative, so the initial improvement brought through one-time actions must be followed up with medium-term changes in health services and longer-term changes in the education and coordination of health professionals. For each proposed intervention, some actions can be taken within 1–3 months, bringing short-term reductions in infant and childhood mortality. These reductions are detailed in the attached summary table.

The reduction in infant and childhood mortality through the implementation of these interventions will not be easy. Each intervention is partially contingent on improvements in security, continued improvement of water and electrical systems, the development of skills among Iraqi staff, and consensus to prioritize child survival. Yet even without rapid improvements in these conditions, much improvement can now begin. Further, if these

conditions are at least partially met and if appropriate programs are developed, child health status in Iraq can quickly be restored to its pre-1990 status.

Intervention	Immediate Actions	Subsequent Actions
BREASTFEEDING	*Distribution of Written Information *Billboards, Radio, and TV Spots	*Educating Community Leaders *Activating Community Child Care Units (CCCU) staff *Legal Statute to Control Formula *Research to Monitor Breastfeeding, Weaning Foods, etc.
IMPROVED DELIVERY CARE AND BIRTH SPACING	*Distribution of Written Information *Equipping Units for Emergency Obstetric Care *Train Midwives	*Training Practitioners *Communications and Transport for Referral *Educating Community Leaders
ORAL REHYDRATION THERAPY	*Distribute Oral Rehydration Solution (ORS) Packets to Households *Distribution of Written Information *Billboards, Radio, and TV Spots *Establish Treatment Algorithms	*Activating CCCU staff *Research to Monitor Care-Seeking Behavior, etc. *Communications and Transport for Referral
COMPLEMENTARY FEEDING	*Distribution of Written Information on Reducing Low Birth Weights *Establish Treatment Algorithms	*Activating CCCU staff *Research to Monitor Intra-Home Food Distribution Practices *Communications and Transport for Referral
NUTRITIONAL SUPPLEMENTS	*Distribute Vit A and Zinc Tabs to Households	*Activating CCCU staff *Research to Target Vulnerable Groups
IMMUNIZATIONS	*Distribution of Written Information *Strengthen Vaccination Programs	*Activating CCCU staff *Research to Target Vulnerable Groups
HOME HYGIENE AND HEALTH PRACTICES	*Distribute Chlorine, Soap, Water Containers, and Flocculants *Distribution of Written Information	*Activating CCCU staff
ANTIBIOTICS TREATMENT	*Establish Treatment Algorithms	*Training Practitioners *Communications and Transport for Referral *Research to Monitor Treatment Behavior

About BASICS II

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Acronyms

ARI	Acute Respiratory Infections
BCG	Tuberculosis Vaccine
CCCUs	Community Child Care Units
CDD	Control of Diarrheal Disease
CDC	Centers for Disease Control
CEHA -	WHO Regional Centre for Environmental Health Activities
CPA	Coalition Provisional Authority
DPT	Diphtheria-Pertussis-Tetanus Vaccine
EPI	Expanded Programme of Immunizations
FAO	Food and Agriculture Organization
GoI	Government of Iraq
GCHS	Gulf Child Health Survey
GMU	Growth Monitoring Units
HPB	High Protein Biscuit
IMC	International Medical Corps
IMR	Infant Mortality Rate
IST	International Study Team
MICS	Multiple Indicator Cluster Survey
MM	Maternal Mortality
MoH	Ministry of Health
NRCs	Nutrition Rehabilitation Centers
NGO	Non-Governmental Organization
NRI	Nutrition Research Institute
OFFP	Oil for Food Program
OPV	Oral Poliovirus Vaccine
ORS	Oral Rehydration Solution
PHCs	Primary Health Centers
TBAs	Traditional Birth Attendants
TFC	Therapeutic Feeding Centers
TM	Therapeutic Milk
TNP	Targeted Nutrition Program
TT	Tetanus Toxoid
TB	Tuberculosis
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
WFP	World Food Program
WHO	World Health Organization

Introduction

This desk review summarizes information drawn together from a wide review of documents, personal observations over seven years, interviews with United Nations and Iraqi government officials, Ministry of Health (MoH) and international organization staff, reviews of UN and Government of Iraq (GoI) databases on survey statistics, selected published and unpublished independent survey research reports, field observations, and post-war rapid assessments. It is supplemented with key informant interviews and focus group discussions held with health care providers and educators in prior months and personal observations in Iraq in the months since the 2003 war.

Iraq has undergone three historical periods of development over the last 20 years. It is now embarking on its fourth period. Within very different contexts, each of the previous periods focused heavily on the funding of curative clinical services rather than a focus on investment in human capacity development. Policy in most areas was not well developed, and consultation with key stakeholders in Iraqi society seldom occurred. The opportunity now exists to learn from rather than repeat the past. Far more effective investments in human and economic development will result, with a possibility to rapidly reduce the current high rates of mortality in under five-year-olds and maternal mortality.

Such a review is important because there is so much misinformation on Iraq. Notwithstanding the existence of key high quality data on child health conditions, most observers instead present mistaken data. It is widely reported, for instance, that:

- The Infant Mortality Rate (IMR) (under one year) rose in 1990/1991, and then slowly fell through the 1990s. In fact, it fell only slightly after a steep rise during 1990/1991, and has remained elevated since.
- IMR fell once the Oil for Food Program began in 1996. In fact, the expected rapid decline in IMR that was anticipated did not occur; through 1999 rates did not fall notably in the Center or South of the country.
- Child Mortality Rate or Under 5 Mortality Rate (U5MR) is currently at the extremely high rates recorded in 1999. In fact, there is strong evidence that rates declined starting in 2000. U5MR is probably currently 90–100/1,000. This represents a 30% decline from the extremely high rates of the late 1990s, but still is about double the rate during 1989/1990.
- It is frequently reported that up to a third of under five-year-olds are malnourished. This was true in 1996, but malnutrition has fallen by half since then.
- It is frequently reported that more than 20% of children are born below 2,500 grams in weight. This figure, promulgated by the previous government, never had a basis in fact or data. Low Birth Weight (LBW) is probably around 9-12%.

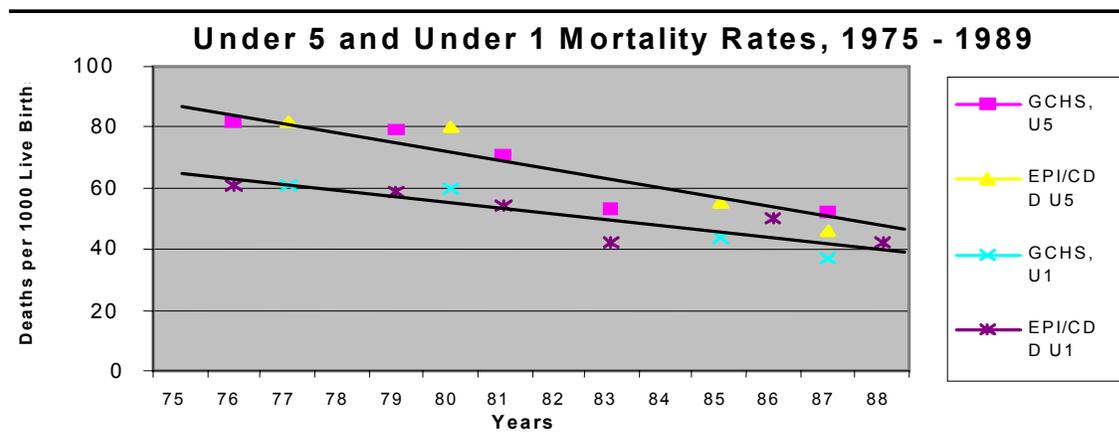
The Current State of Child Health

Iraq is a young country, with 42% of the population under the age of 15 years (WHO, Geneva, 1998). Like many Arab states, it had relatively high levels of young child mortality compared to its level of per capita income during the 1960s and 1970s.^{1,2} The rate of mortality among young children was falling (see Figure 1) when deaths in the Iraq-Iran war (1980-1988) led GoI to stimulate population growth. The country's total population in 2002 was estimated by the World Food Program (WFP) at 27,072,000 for the Oil for Food Program (OFFP). Estimating population growth at 3% in the subsequent year and considering the total population of under five-year-olds was 15.26% per the 1997 national census, the under five-year-olds population in mid-2003 can be netted at 4.3 million.

Mortality Rates

Information on mortality through 1999 is high quality due to several research efforts. In the 1980s, the Gulf Council of Health Ministers surveyed each of the seven countries in the Gulf region. The Iraqi sample included 9,404 households, including 9,583 ever-married women of childbearing age and 11,791 children under six years of age. The Gulf Child Health Survey (GCHS)³ conducted in Iraq in March/April of 1989 was the last survey carried out in this series. This survey had both individual- and household-level modules. The module on child care, relating to children six years old or younger, is the main portion of the data collected in the questionnaire used in this report. The full report is proprietary and has never been released by its authors. A detailed summary of that report provided both direct and indirect estimates; the indirect estimates are used here, and refer to the period from 1975 to 1986.

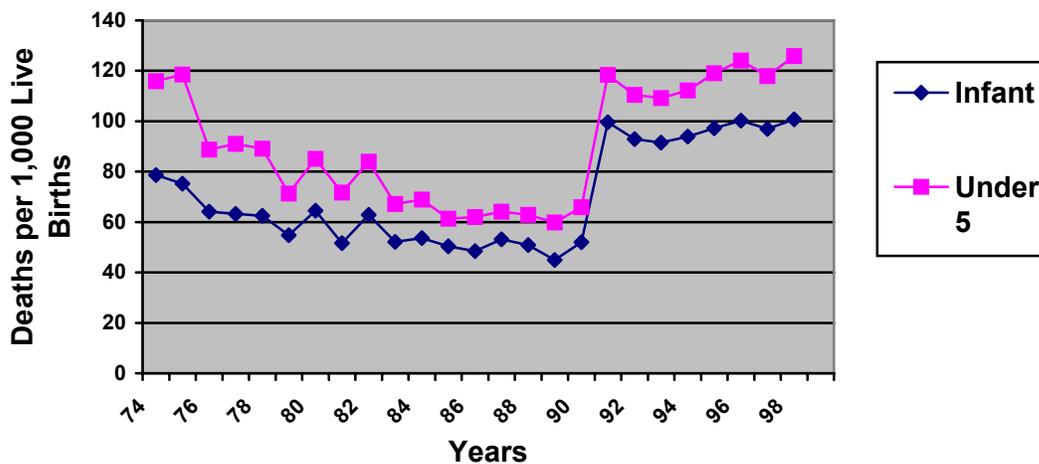
Figure 1: Under 5 and Under 1 Mortality Rates, 1975–1989



In May 1990, UNICEF collaborated with the Ministry of Health and Ministry of Planning to conduct the Iraq Immunization, Maternal and Childhood Mortality Survey (Expanded Programme of Immunizations/Control of Diarrheal Disease, or EPI/CDD)⁴. This survey provided direct and indirect estimates of mortality among mothers and children. About 10,000 women of childbearing age across Iraq were surveyed.

Estimates of pre-1990 mortality show a high level of agreement. Although curative health services, potable water, urbanization, importation of foods, and education of women were paid for with rising petroleum exports, Iraq demonstrated only a gradual decline in infant mortality during the 1960s and 1970s. Governmental policy favored population growth. The strategies to achieve this were limitations on family planning and abortion coupled with programs to reduce mortality among infants and young children. Targeted programs were then implemented in the early 1980s to improve vaccination coverage, promote breastfeeding, reduce diarrheal morbidity, and improve domestic hygiene. These programs are associated with the accelerated decline in infant mortality during the 1980s⁵ (See Figure 2).

Figure 2: Mortality among Under 1s and Under 5s, 1975-1999



Compared with neighboring Jordan, Iraq in the 1980s had lower measles vaccine coverage, a higher proportion of women giving birth without professional assistance, a lower percentage of women receiving prenatal care, a lower female literacy rate, a lower rate of breastfeeding at birth, a higher percentage of children having diarrhea in the preceding two weeks, and a lower proportion of the population with access to clean drinking water⁵. Each of these factors suggests that infant and child mortality should be higher in Iraq than Jordan. Indeed, indirect estimates from similar surveys (EPI/CDD) in Iraq and Jordan generated estimates of infant and under-five mortality that were consistently higher in Iraq during 1981–1987. Yet more rapid mortality declines in Iraq left rates increasingly similar in the two countries toward the late 1980s.

The decline in the 1980s was dramatic, especially in light of the Iran-Iraq war from 1980–1988. That war resulted in an estimated 100,000 deaths among Iraqi soldiers and in a major diversion of economic resources to the war. Little of the fighting, however, occurred in the interior of the country. Despite limitations on social investments during these years, education levels of the population improved, access to doctors and hospitals improved, the population continued to become more urban, clean water became more accessible, food prices remained stable, and immunization coverage improved.⁶

In 1977, the Iraqi government estimated its infant mortality rate at 61/1,000; by 1987, the

infant mortality rate had fallen to around 40 (36 according to GCHS, 42 according to the EPI/CDD). An unpublished 1992 report by UNICEF statistician Gareth Jones summarized, "Evidence . . . point(s) to a strong, rapid downward trend in infant and child mortality over the past fifteen years. During the 1980s, in particular, the downward trend in infant mortality has been particularly steep"⁷.

The accelerated decline of mortality in the 1980s was dramatic, especially in light of the Iran-Iraq war that resulted in a major diversion of economic resources to the conflict. However, little fighting occurred in the interior of the country and health services were not much affected. Despite limitations on social investments during these years, education levels of the population improved, access to doctors and hospitals improved, the population continued to become more urban, clean water became more accessible, food prices remained stable, and immunization coverage improved. Thus, both improving conditions of life and targeted child mortality reduction program accelerated the decline of mortality among young children. This experience bore lessons for the 1990s when programs became weak and the quality of life deteriorated. Mortality decline was greatest among post-neonates, where targeted child survival programs had the most impact. This was confirmed by data from the 1999 Morbidity and Mortality Survey (see Figures 3 and 4)^{8, 9}.

Figures 3: Mortality in Center/South, 1975–1999, by Age Group

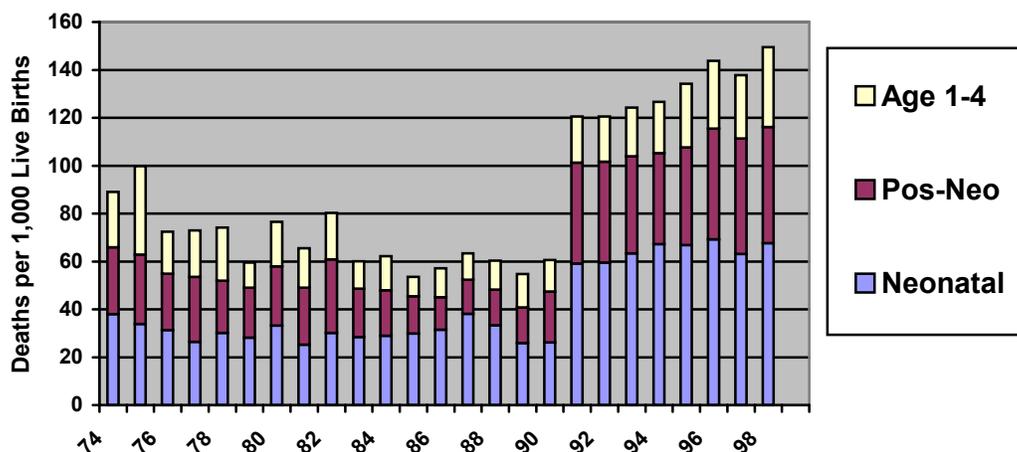
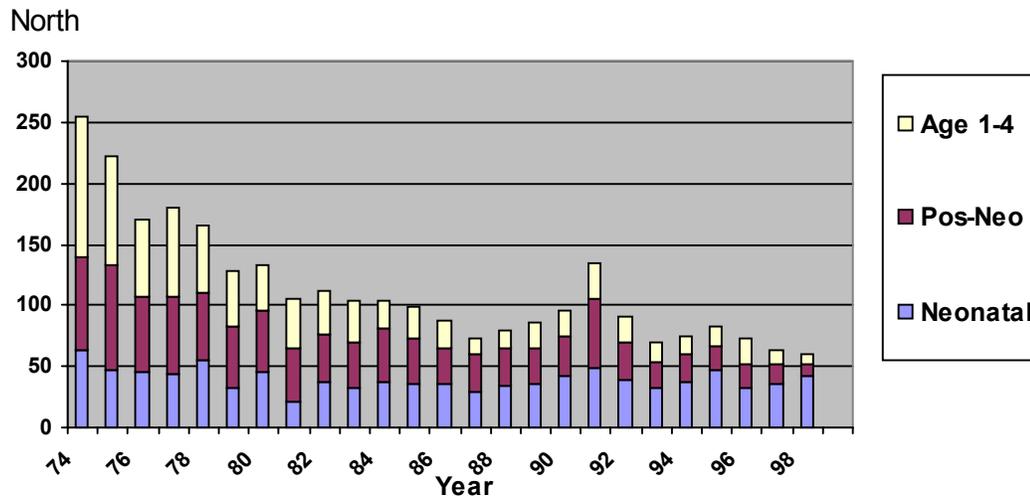


Figure 4: Mortality in the North, 1975–1999, by Age Group



The constraints on access to essential goods that began in 1990 were quickly associated with an impact on mortality among young children. Comparing the mortality rate of under one-year-olds during the pre-war sanctions period of August 1990–January 1991 to the mortality rate during the same months in the previous year, the rate rose from 36/1,000 to 42/1,000¹⁰. This represents a 17% rise in infant mortality. Among under five-year-olds, the rate for the pre-war sanctions period (August 1990–January 1991), compared to the same months of the prior year, rose from 44/1,000 to 49/1,000 for under five-year-olds, representing an 11% increase. This rise in mortality went unrecognized at the time, but was an important indication of what was to come.

The rise in mortality, while only modest in magnitude compared to later mortality increases, suggests that deterioration associated with sanctions—even without subsequent war-related destruction—had a far-reaching, negative impact on the health of young children. During the 19-week period of sanctions, electric power, water, and transportation systems throughout Iraq were still intact. Civil war in Kurdish and Shiite areas had not yet begun. The only notable changes identified during this period were the partial withholding of food stocks and medicines in response to sanctions and in anticipation of war. It appears that these relatively minor changes were sufficient to increase the risk of death in the most vulnerable population sectors. Increased risk of death occurred almost entirely among children ages two to fifteen months. There was no excess rate of death after fifteen months of age.

Newborns can be largely protected from external threats of death by maternal antibodies and breastfeeding. Poor or uneducated mothers' children who are not breastfed or who are weaned early face diarrheal disease and malnutrition that can lead to death without timely medical intervention. It will subsequently be seen that children in these age groups were particularly vulnerable to high rates of malnutrition and mortality following the 1991 war as well. The percentage of hospital admissions for malnutrition rose from about 1% in early 1990 to 2.5% from September 1990 through April 1992.

In August 1991, following the Gulf War, the International Study Team (IST) conducted a community-based cluster sample survey collecting data on live births from January 1991 through August 1991 in 17 of the country's 18 governorates. In the eight-month period

following the 1991 war, mortality among children under five years of age rose from around 50/1,000 to about 120/1,000.

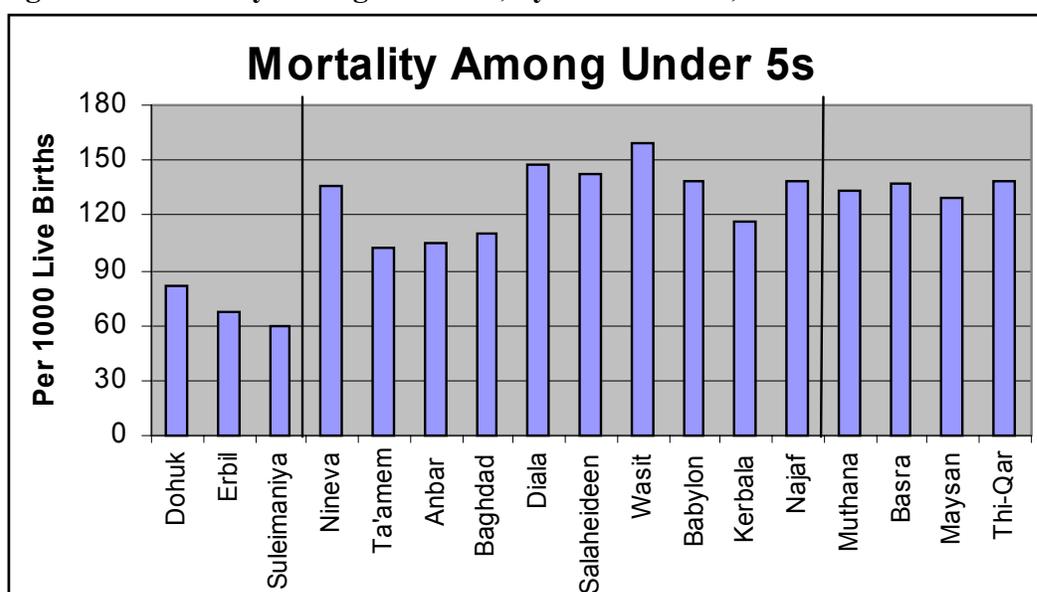
The IST estimated excess mortality rates at 1.8 /1,000 during the first month of life, 4.3/1,000 for the second to the eleventh month of life, and 5.2/1,000 for one- to four-year-olds.¹¹ Babies under one month of age were thus relatively protected, even though mortality is known to be high for newborns. Deaths reportedly due to diarrhea rose fivefold, and the rate for injury-related deaths rose fourfold. Before the war, 20.7% of all deaths among under five-year-olds were due to diarrhea; during and after the war, 38% of deaths were due to diarrhea. Diarrhea had already become more common in the pre-war sanctions period; it was further exacerbated in the period of war-induced destruction of electric and water systems throughout Iraq. This was especially true in Kurdish (North) and Shiite (South) areas where uprisings occurred in the immediate post-war period. Mortality among Kurdish children, displaced en masse to areas without sanitary conditions by the uprising in the north, rose from 3.5 times the pre-war rate in Baghdad to 11 times the rising rate in the capital. A mother's education was always an important predictor of young child survival. Increased dangers to child health in the unsanitary environment further exacerbated the influence of mother's education on child survival. The under five-year-old mortality rate was 2.5 times higher for illiterate mothers compared to literate mothers before the war; and illiterate mothers were at a greater disadvantage after the war, experiencing an under five-year-old mortality rate 3.5 times higher during and after the war. The rise in male infant deaths exceeded females, and the rural death rate was about 30% higher than the urban rate.

In 1994, the Iraqi government reported that sanctions caused a greatly increased number of deaths.¹² It provided data showing a rapid rise in mortality among under five-year-olds, up from 592 per month in 1989 to 2,289 per month in 1991, 3,911 per month in 1992, and to 4,409 per month in early 1994. These data were derived from hospital-based death reports for all under-fives dying from respiratory infections, diarrhea, gastroenteritis, or malnutrition. For over fifty-year-olds, the mortality rate was reported to have risen from 1,685 per month in 1989 to 4,872 in 1991, 6,378 in 1992, and to 6,731 in 1994. The main recorded causes of death were cardiac disease, hypertension, diabetes, renal disease, liver disease, and malignant neoplasm. In post-war Iraq, however, hospital deaths represented a declining proportion of all (not just sanctions-related) deaths, and thus providing an unreliable indicator of mortality change. UN agencies published reports using these data, without critique or identifying the source, as the basis for an estimate of 4,500 excess deaths per month among under five-year-olds. Subsequently, various UN humanitarian agencies continued to report 4,500–6,000 excess embargo-related deaths per month as if the rate were a verified fact.

Yet after the IST survey in 1991, there were no minimally reliable data on mortality generated in the next eight years. In 1999, UNICEF, in cooperation with the Government of Iraq (GoI), carried out a methodologically rigorous indirect demographic survey. This survey was carried out with international supervisors, frequent validity checks, and a national sampling frame. The survey demonstrated that the under-five mortality rate in the Center and the South, which averaged 56/1,000 (95% C.I. 52-58) in the pre-Gulf war period (1984–1989), rose to 91/1,000 (95% C.I. 87-95) during 1990–1994, and then rose higher to an average 131/1,000 (95% C.I. 127-135) during 1994–1999. This last rate had not been experienced since a quarter of a

century earlier. Rates for the Kurdish autonomous region during the time period of 1994-1999 showed an overall decline from 80 to 72/1,000 for under five-year-olds and from 64 to 50/1,000 among infants. Infant mortality in the Center/South regions (defined as the death of children in their first year) increased from 47/1,000 to 108/1,000 within the same time frame. Infant deaths were 18% higher and child deaths 23% higher in rural areas, in both the North and the Center/South. Mortality rates for males were 10–20% higher. As in earlier surveys, the strongest predictor of mortality was the education level of the mother. Mortality rates of children whose mothers were uneducated, compared to mothers with intermediate or higher education, were twice as high in the North and about 30% higher in the Center/South. Mortality rates among under five-year-olds in the three North Governorates of Iraq were less than half the rate (60/1,000) found in the Center/South Governorates (150/1,000) by the year 2000 (see Figure 5).

Figure 5: Mortality among Under 5s, by Governorate, 1995–1999



*Northern Governorates include Dohuk, Erbil, and Suleimaniyah
 Southern Governorates include Muthana, Basra, Maysan, and Thi-Qar
 Other Governorates are included in Central Iraq (See Map on Last Page of Report)

Even with improved supplies via OFFP, the health system responded slowly and inefficiently to the changing disease profile and the level of available technology in the country. In the early 1990s, diarrhea is believed to have become the most common fatal pathology among young children, followed by acute respiratory illness. Together they are frequently stated to be responsible for around 70% of deaths among under five-year-olds, but low rates of death registration make it impossible to examine this.

The GoI first reported a decline in the high rates of young child mortality in February 2001 in an Iraqi newspaper. Ministry of Health (MoH) monthly records show such a decline only in early 2002. These data are drawn from hospital records. Since only about a third of all deaths occur in hospitals, these data may not be a timely representation of trends¹³. In the context of an increase in the number of total visits to hospitals and a rapid decline in malnutrition since

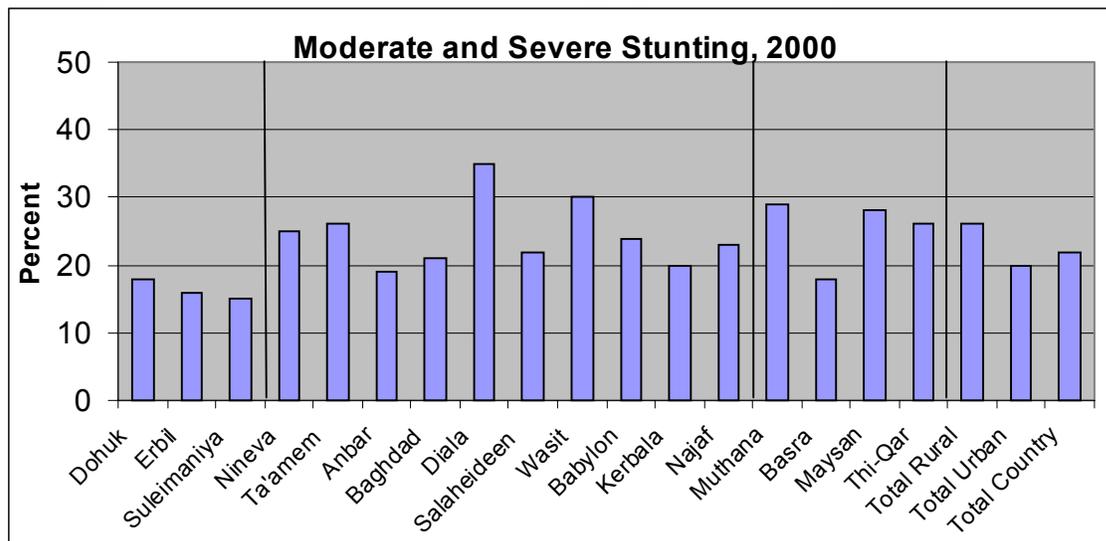
2000, it is reasonable to assume that there has indeed been a decline from the very high levels of child mortality in the late 1990s. The decline from a high rate of 131/1,000 among under five-year-olds during 1995-1999 may well be to a rate of 90–100/1,000. This decline is only moderate and was delayed from the initial re-supply of the health system via OFFP in 1997.

With respect to infant mortality rate, Iraq ranked 104th among the 176 countries in 1978, while Jordan ranked 88th. In 1998, Iraq ranked 149th, while Jordan ranked 72nd. Regarding maternal mortality, of 159 countries Iraq ranked 101st and Jordan ranked 78th.

Nutrition

While large-scale, representative demographic surveys were carried out in the 1980s or earlier¹⁴, no similar baseline information for the pre-sanction period before 1990 exists on nutrition. Studies in Baghdad demonstrated 3-4% of under five-year-olds to be more than two standard deviations below the mean reference population's weight.⁵ This indicates that chronic and acute malnutrition rates were modest and similar to those of a well-nourished population. But only five health centers were involved in these studies; rates of underweight were very low at four centers and 18% at the fifth. A study in Basra in 1983-1984 found that 5% of infants were underweight. The rates for Baghdad were similar to that of the reference population, indicating a low level of malnutrition in the capital city. Malnutrition was likely to be more common in outlying governorates, poor parts of the city, and rural areas (see Figure 6). The Iraqi MoH reported that from January 1989 through August 1990 approximately 1% of hospital admissions was due to malnutrition.

Figure 6: Moderate and Severe Stunting, by Governorate, 2000



Rations

A rationing system was initiated in September 1990 after sanctions were imposed. The system provided wheat, rice, cooking oil, and sugar at highly subsidized prices. This ration provided from 900 to 1,300 calories per capita per day during September 1990 through June 1991 (see

Table 1).¹⁵

The ration declined to 1,093 kilocalories per person per day prior to OFFP. It rose to 2,215 Kcal by September 2002, making it one of the most calorie-rich ration programs in the world. Rations provided by the OFFP are not sufficient to cover all the micronutrient or protein needs of the population. It is nonetheless a popular program and continues a tradition of government subsidization and management of food distribution. In the North, 5% of people sold part of the ration. Greater poverty in the Center/South means that more people in those regions sell the ration. Perhaps the highest rate of selling rations was among the Marsh Arabs. Upon their return to the drained marshes in 2003, they were left without their traditional sources of income and about half sold part of the ration.

Food purchases consumed 54% of disposable income in 1972, declining to 43% in 1985. Food purchases rose to 50% of family income during the Iran-Iraq war in 1988 and reached 72% in the Center and South during 1993, even though most food was provided at nominal cost via monthly rations. When food purchases exceed 60% of income a crisis is at hand, and rates as high as 70% have seldom been recorded.

Table 1: Calories Distributed per Capita, 1990–2002

Pre-1990*	1991	1992	1993	1995	1996	1997	1999	2002	2003
3,315	1,300	1,770	1,654	1,093	1,295	2,030	2,150	2,215	2,215

*Pre-1990 figures stand for total estimated calorie availability. Subsequent figures are ration only. An average 500 additional calories are estimated to have been available off-ration.

Low Birth Weight

The percentage of children weighing less than 2.5 kg at birth was reported to be 5% in 1984 and 9% from 1982 through 1988.⁵ The MoH reported in 1990 that of the approximately 60% of all births occurring in public hospitals, 4.5% were under 2.5 kg. This low rate was comparable to that in developed countries and was much lower than the average rate of 14% in Arab countries. In sum, Iraqi living, nutrition, and health standards in 1990 were relatively high.

The rate of low birth weight was reported to have risen to greater than 20% in Iraqi government hospitals during 1995-1999. Such data are highly suspect as they are inconsistent with expected levels in comparable countries and demonstrate an opposite trend to the slow improvement found in all other child health and nutrition indicators.¹⁶ It is thus considered invalid and will not be included for further analysis here. A more reasonable estimate, based on parental recall from the 2000 Multiple Indicator Cluster Survey (MICS), was 12%.

Anthropometry

There has been considerable confusion and misreporting about malnutrition levels in Iraq. Solely the surveys used to find the data presented in Table 2 and Figures 7 and 8 were national in scope; they were based on households and generated a representative sample, to some extent. Other studies are based on clinic exit surveys; they provide fewer representative samples of the population of young children than a household survey. The results from the two types of surveys cannot be directly compared.

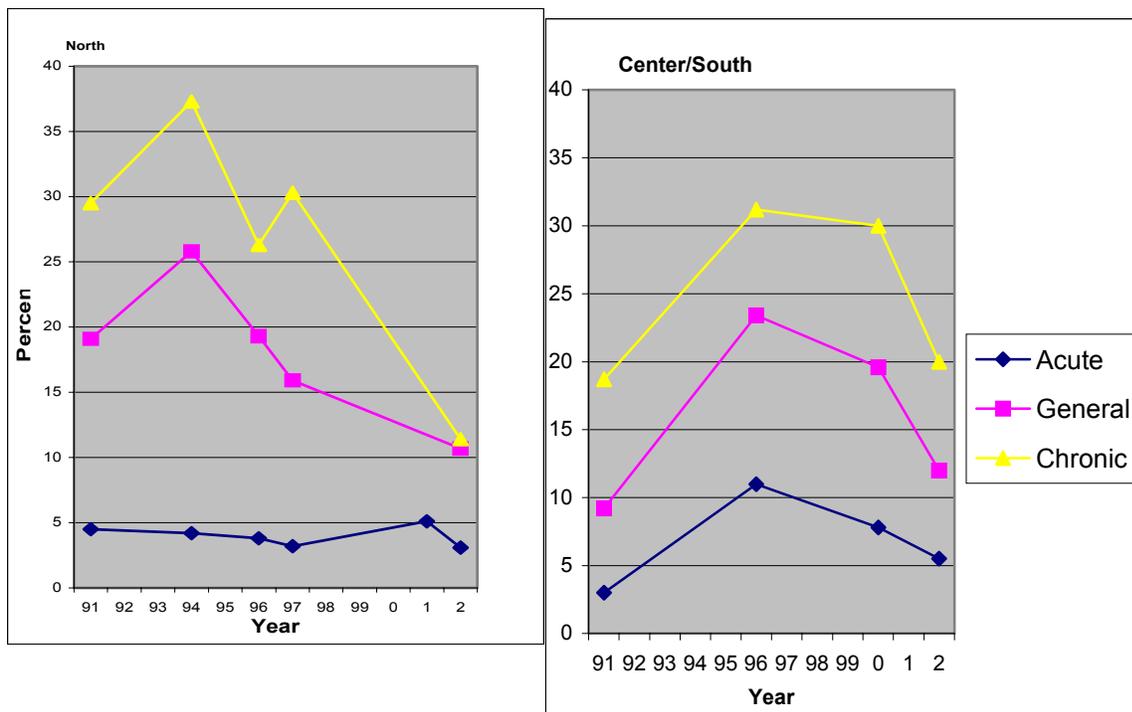
There are no population-based data on routine nutritional indicators for Iraq prior to 1991. Data from the IST provide a post-war baseline¹¹ (see Table 2). These rates, while lower than any other period in the 1990s, were surely higher than pre-war and pre-sanction levels in the late 1980s.

Table 2: Rates of Under-Nutrition among Under Five-Year-Olds, 1991–2002

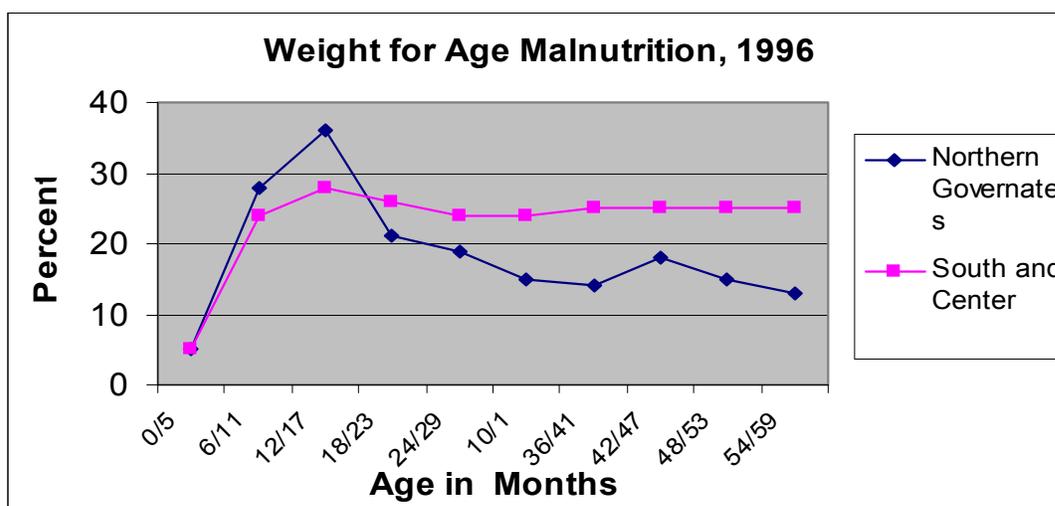
	1991	1996	2000	2002	Arab Country Average
Acute Malnutrition	3.0	11.0	7.8	4.0	9%
Underweight	9.0	23.4	19.5	9.4	20%
Chronic Malnutrition	18.7	32.0	30.0	20.1	28%

The 1996 MICS undertaken by the GoI and UNICEF confirmed the serious nutritional status of young children in Northern Iraq. About one in every five children (19% or 95,000 children) was underweight (low weight for age), and 26% of children under five years of age (or 130,000 children) were chronically malnourished (low height for age), with children ages 6 to 24 months most at risk.¹⁷

According to UNICEF survey data on malnutrition prevalence in under five-year-olds for the Center/South of Iraq in 2002, the percentage of general malnutrition has declined to 9.4 % in 2000. There was a similar decline in stunting to 23.1 % in and wasting to 4.0%. Iraq was approaching the levels of malnutrition present in 1991, near the beginning of the crisis. It had not had levels this low in a whole decade. Table 2 demonstrates that Iraq in 2002 had favorable rates of malnutrition in comparison to the average for Arab countries in 1991.² Rates that were higher than the Arab country average in 1996, had declined to a level similar to Arab countries in 2000, and were again better than the Arab country average by 2002. By the mid-90s, the North had lower than average rates, which continued to decline after the year 2000. Moderate and severe rates or underweight malnutrition in the North (Dohouk, Erbil, Suleimaniya) were less than half (17%) in 2000 (see Figures 7 and 8).

Figure 7: Malnutrition among Under Five year Olds, 1991 – 2002, North**Figure 8: Malnutrition among Under Five year Olds, 1991 – 2002, Center/South**

In the immediate post-war period, during April 29 to May 3, 2003, UNICEF and the Nutrition Research Institute (NRI) carried out a nutritional status survey among under five-year-olds in Baghdad¹⁸. Such data are compared to the two previous representative sample studies on malnutrition in Baghdad. The data are not directly comparable, as some better-off children had left Baghdad during the war. Malnutrition levels were similar after the 2003 war than after the 1991 war, except for acute malnutrition, which was nearly double that of levels in 1996 (see Figure 9). Given that malnutrition rates declined by about half in Iraq from 2000 to 2002, it can be assumed that 2003 data represent a short-term rise in malnutrition levels compared to pre-war rates (see Table 3).

Figure 9: Weight for Age Malnutrition, 1996**Table 3: Moderate and Severe Malnutrition in Baghdad**

Malnutrition Type	Indicator	IST Study, 1991	FAO Study, 1997	April/May 2003
Underweight	Weight/Age	6.9	11.3	13.2
Stunting	Height/Age	12.2	15.7	15.9
Acute Malnutrition	Weight/Height	3.1	3.3	7.7

Regional Differences

The differences in the types of malnutrition in under 5 year olds between 1991 and 1996 shows a marked regional difference between the North and the Center/South governorates reflecting the varying conditions the population was subjected to. In the Center/South, the percentage of all types of malnutrition peaked in 1996, whereas in the North it peaked in 1994 (see Figures 7 and 8). Regional differences were also noted in 2000 (see Figure 10).

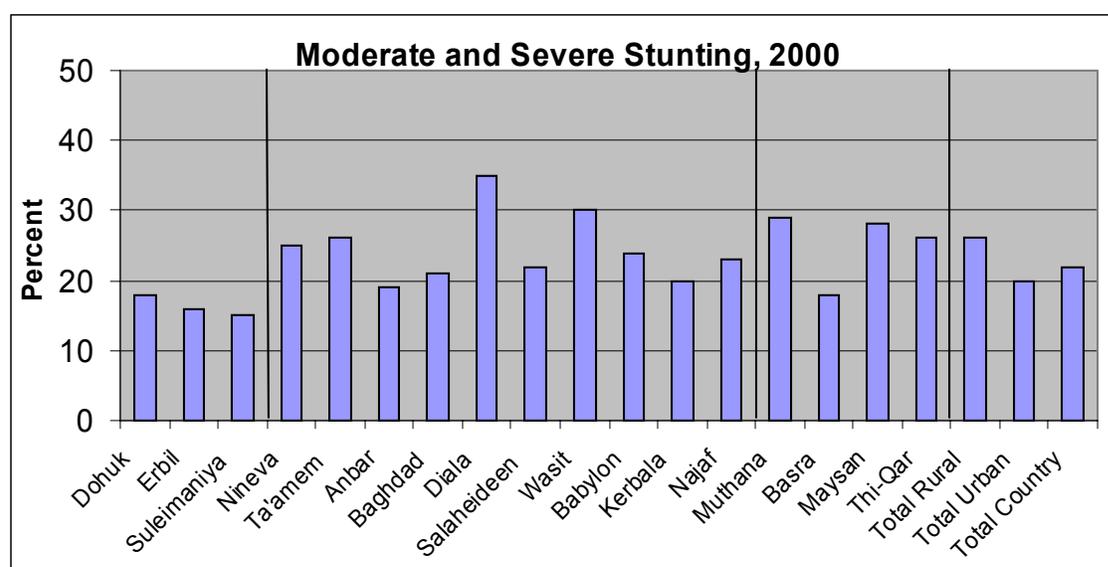
In the North, about a quarter of all families both grow and purchase considerable additional foods.¹⁹ The poorest families barely get by on the ration, facing some days without food each month. In contrast, affluent families perceive greater food needs, reported that rations provide for food needs during less of the month, and are frequently obese.

By 2003, the rationing program included the following items: wheat flour, rice, sugar, tea, cooking oil, milk powder, dried whole milk and/ or cheese, fortified weaning cereal, pulses (beans, chickpeas and lentils), iodized salt, soap, and detergent. These same ration goals were re-established after the war. The Targeted Nutrition Program (TNP) includes therapeutic milk and high protein biscuits (HPBs). The OFFP food ration by the World Food Program provided 350,000 metric tons of food per month.

Nutritional promotion and education was stimulated by Nutrition Rehabilitation Centers

(NRCs) and Community Child Care Units (CCCUs)²⁰. Twenty NRCs were initiated in hospitals and health centers in 1995. CCCUs started with 100 centers in 1996. These centers were designed to distribute extra food rations to children (based on weighings), and the rations are supposed to be accompanied by health education. Like many such programs around the world, evaluators found that these centers provided little education and health promotion. In the 15 Center/South Governorates in 2002, there were a total of 67 NRCs in hospitals, 548 NRCs at Primary Health Centers, and 3,000 CCCUs. Some 13,000 CCCU volunteers have been trained in the rehabilitation of malnourished children and screening/growth monitoring activities. Of these, 95% were teachers, and most of the CCCUs were located in primary schools. Around 1.1 million children were screened via this system in 2002.²¹ It is believed that this covered 7% of children and half of the pregnant women in the country.

Figure 10: Moderate and Severe Stunting, by Governorate, 2000



In the North Governorates, there were growth promotion programs in 61 of the 418 Primary Health Centers (PHCs) before SCR 986. As of May 2000, UNICEF reports that in the North Governorates there were 215 CCCUs, 13 NRCs, 350 Growth Monitoring Units (GMU) and 195 Therapeutic Feeding Centers (TFC). As of April 2001, UNICEF reports a total of 400 GMUs and 269 CCCUs.

Food purchases fell to 37% of income in the North in 2000. Throughout the country, the market price of the food basket declined by about 30% from 2000–2002 due to increased productivity with OFFP inputs and an end to the region's drought.

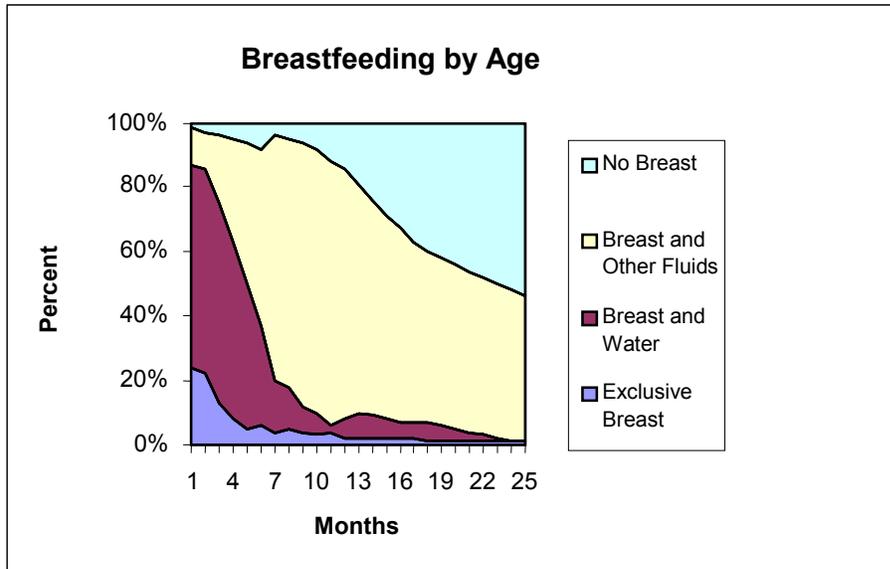
About half of the CCCUs were able to distribute HPBs soon after the 2003 war and 47% of NRCs had adequate supplies. To assist children suffering from malnutrition, UNICEF provided PHCs with HPBs and Therapeutic Milk.^{22, 23}

Breastfeeding

In the context of social crisis in the early 1990s, mothers tried to improve their care of young

children by marginally increasing breastfeeding. Rates of ever-breastfed children reportedly rose from 89% in 1988 to 94.7% in 1996 (see Figure 11 and Table 4). Breastfeeding at six months of age rose slightly from 60% in 1988 to 65.4% in 1996. But according to a October 1997 study, 21% of all infants in central and southern Iraq were exclusively bottlefed, only 13% of infants were exclusively breastfed during the first four months of life (compared to an average of 37% in all Arab countries), and 34% of 6- through 9-month-olds received milk without any supplementary weaning foods.

Figure 11: Breastfeeding by Age, 1996



Source: MICS 1996

A household survey in 1994 by the MOH in six governorates found that "total dependence" on breastfeeding was 71% (85% in rural areas and 62% in urban areas).⁶ A survey in the South/Center region in October 1997 found that 87% of infants ages zero to five months, exclusive breastfeeding (only breast-milk) had been stopped by the fifth month; 21% of infants at that point were already being bottle-fed. Weaning practices were also problematic; 24% of infants ages six to eight months did not receive any complementary food.²⁴

The Iraqi legislature drafted and the cabinet approved a code on the protection and promotion of breastfeeding in 1994. It was then submitted to the President's office but was never approved. At that time, infant formula had been taken off the ration and the price of formula in the marketplace rose rapidly. It is assumed that this experience convinced the government not to implement the code despite heavy advocacy by UNICEF, pediatricians, and many international visits.

Inclusion of infant formula in the ration in 1998 actually discouraged breastfeeding. The UN recommendation to the GoI for removal of infant formula went unheeded. Bottle feedings among infants increased from 21% in 1996 to 31% in 1998, and the introduction of complementary semi-solid foods failed to reach a third of children ages six through nine months²⁵. Modifying hospitals to become baby-friendly supports breastfeeding. A total of 31 hospitals in Iraq achieved the rating of being a baby friendly hospital. An educational intervention and survey in

2002 reported that exclusive breast-feeding among zero- to four-months-olds rose from the 17.1% rate in the MICS 2000 survey to 30.7% in 2002.

Table 4: Breastfeeding Characteristics, 1996 and 2000

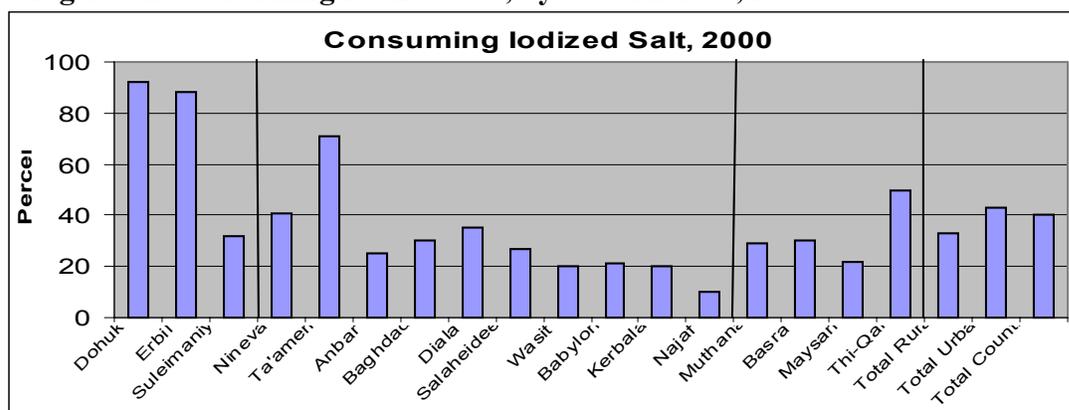
	South/Center 1996	North 1996	South/Center 2000
Ever Breastfed	94.9	99.3	---
Breastfed 0-11 months	----	68.5	---
Breastfed 12-15 months	64.2	47.4	58.6
Breastfed 20-23 months	24.9	17.3	27.0
Bottle Feeding (Ever)	19.7	29.4	
Complementary Foods 6-9 months	77.9	----	51.0

Source: Multiple Indicator Cluster Survey of Iraq, UNICEF, 1996 and 2000

Micronutrient Deficiencies

Iodine deficiency disorders in school children were estimated at between 8–14 % in 1978 and had risen to 44 % by 1993. Iodized salt use was much higher in the North (70%) than in the rest of the country (25%), but consumption of non-iodized salt off the ration was common. The percentage of children receiving a dose of vitamin A was higher in the North as well: 25 % vs. 10% (see Figures 12 and 13).

Figure 12: Consuming Iodized Salt, by Governorate, 2000

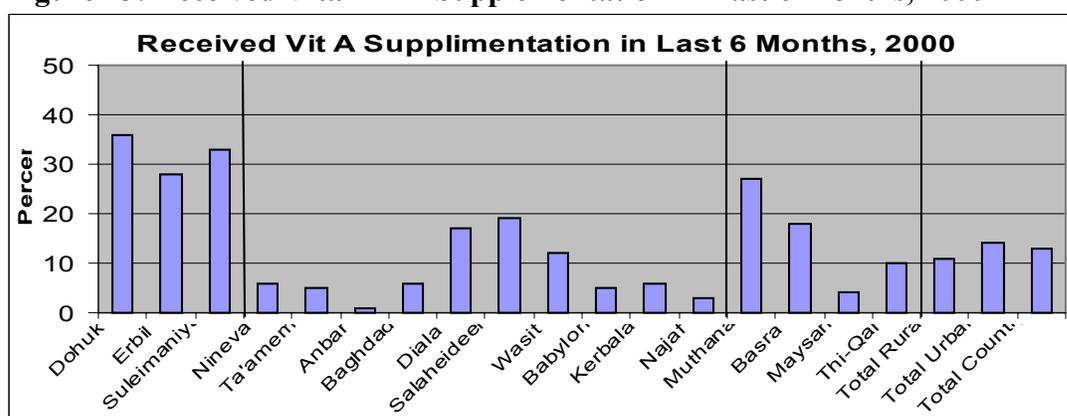


The problem of Iron Deficiency Anemia (IDA) has an impact on the physical and mental development of children, the safety and survival of women in childbearing age, and the energy and stamina and work performance of all the sectors of the population. A national Flour Fortification Committee was formed in the late 1990s for implementation of a proposed national project for iron folate fortification of wheat flour. The Nutrition Research Institute (NRI), WHO, and UNICEF failed to overcome resistance from commercial flour plants, which prevented implementation of the flour fortification program. To address iron deficiency anemia in mothers

and children, a supplementation program of iron folate tablets is needed for pregnant and lactating women. Anemia among pregnant women reportedly rose from 51% in 1995 to 60% in 1999. The GoI began local production of iron and folic acid tablets in November 2002.

In 1994, a vitamin A survey was conducted on 8,575 children under five years of age in Baghdad, Mosul, and Basra.²² The study revealed a prevalence of 2.2% of vitamin A related diseases. It is not clear from these data what the level of vitamin A deficiency is in the population, but it has been suggested that any country with IMR over 70/1,000 should be assumed to have a high prevalence of deficiency. Vitamin A supplementation has been provided via PHCs to children under two years of age as part of the immunization program. Vitamin A is also provided to lactating mothers and first-year primary school students.

Figure 13: Received Vitamin A Supplementation in Last 6 Months, 2000



Morbidity

Overall, indicators of mortality and well being show that by 1996 conditions in Iraq declined to levels that had last existed about 25 years before (see Table 5).

Table 5: Evolution of Health Status

Indicator	Mid-1980s	1990-1991	1996	Poorest Level After 1991	Year When Previously at this	Most Recent Reliable Information (Year)

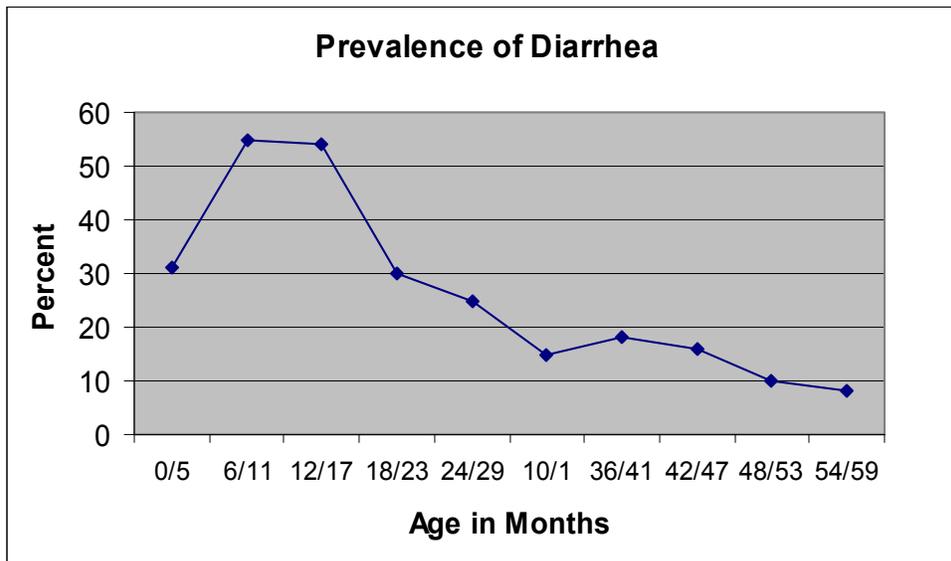
				(Year)	Poorest Level	
Infant Mortality Rate	52	42	97	102 (1999)	1,970	102 (1999)
Under Five Mortality Rate	64	42	126	126 (1999)	1,970	Below 100* (2000)
Chronic malnutrition (Stunting)	C/S N	18%* 12%*	18% 29%	32% 26% 32% (1996) 37% (1994)	-	19% (2002) 11% (2002)
Maternal Mortality per 100,000 births	-	121	-	294 (1989-1998)	-	NA
Diarrhoea Episodes per Child per Year	-	3.8	-	14.4 (1996)	-	NA
Calories Available Per Capita	3,926	-	-	1,600 (1,090 on ration + 500 estimated purchase, 1995)	1,961	2,300 + 1,000 (2003)
%Births Below 2.5Kg	5-9%	4.5%	-	12%	-	

Notes: (-) = Indicates no reliable data available; * Indicates projection. All other data are from routine sources or representative surveys.

When under-five mortality exceeded 100 per 1,000 in the 1990s, it is believed that infectious diseases were the most frequent cause of death in the country.²⁶ The most common among these were surely diarrheal diseases and acute respiratory infections (ARI), which are said to account for 70% of deaths in children under five years of age. Together with neonatal conditions, they represent the three conditions that form the bulk of excess mortality.

Infectious Diseases

Diarrhea incidence among under 5 year olds is reported to have increased substantially. The reportable disease reporting system recorded a skyrocketing increase in diarrhea cases, but this likely reflects a strong bias in reporting. More useful were household surveys, in which diarrhea increased from 3.8 episodes per child per year in 1990 to 14.4 per child in 1999 (see Figure 14). Outbreaks of diarrheal diseases are especially common in the summer. Poor electric and water services, deterioration of infrastructure, and poor sanitation habits, all combined with overcrowding contribute to cholera outbreaks (most recently in 1998 and June-August 2002) as well as other diarrheal diseases. Cholera became endemic in all governorates of the Center/South regions following the Gulf War period. Rural areas are particularly affected during April to November (see Table 6). Cholera reporting is far better than diarrhea overall and can be considered an indicator for trends in diarrhea incidence.

Figure 14: Prevalence of Diarrhea, 1996

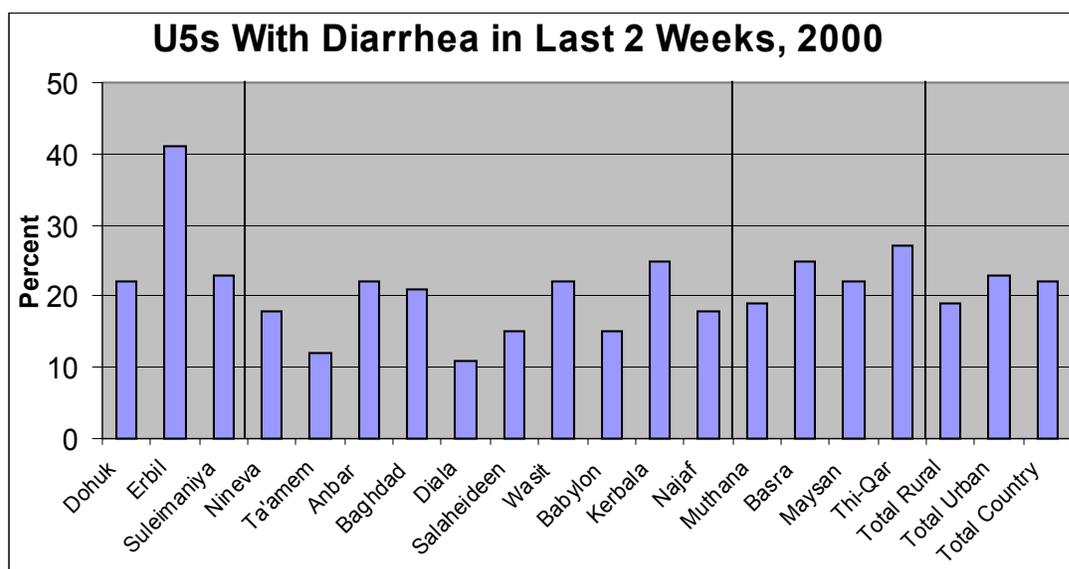
Source: MICS 1996

Table 6: Cholera Cases and Deaths Reported, Basra 1998–2002

Year	Cases	Deaths
1998	53	1
1999	1,985	30
2000	532	4
2002	718	0
2003	104	0

Source: WHO

Among the health indicators in the MICS 2000 household survey, only rates of diarrhea in the last two weeks were not lower in the three North governorates than in the rest of the country, where the average was 15–20% (see Figure 15).

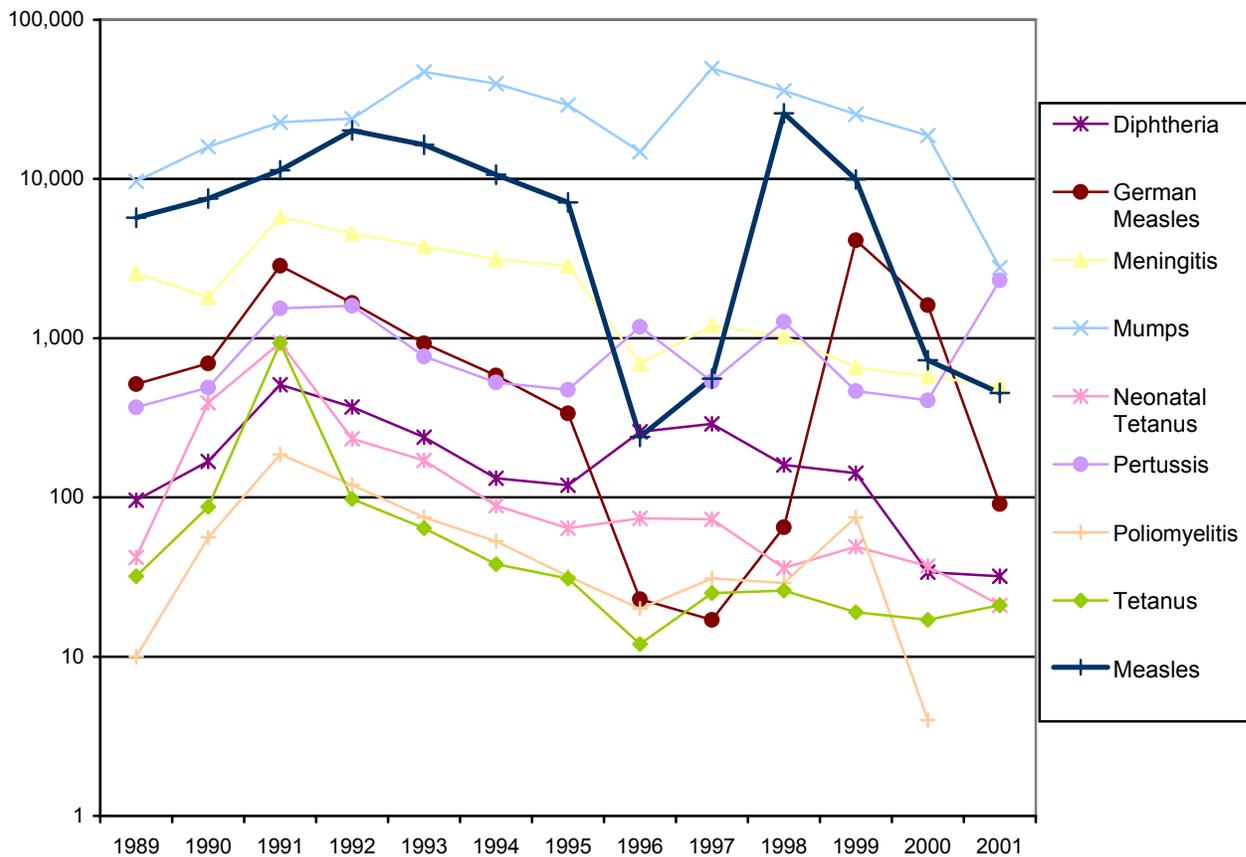
Figure 15: U5s with Diarrhea in Last 2 Weeks, by Governorate, 2000

In a health facility survey of 1997, three-quarters of reported diarrhea cases occurred in under two-year-olds, with the highest peak in those 6-11 months of age. MoH data showed a decrease in the incidence of diarrhea cases between 1998 and 2001. The MICS household survey 2000 showed that 30% of children under five years of age in northern Iraq had diarrhea in the two weeks prior to the survey. The percent of ARI cases dying in hospitals was reported as 2.9%, and the percent of diarrhea cases dying was 1.4%. The MoH reported this to represent a ten-fold increase.

The incidence of ARI was also reported to increase in the early 1990s, and has remained high over the last decade; 32,000 cases of ARI were recorded in 1990, while 152,932 were reported in 2000²⁵. According to a survey conducted in health facilities in six governorates in 2001, of all under five-year-olds registered, 16% had pneumonia. In North governorates, a high proportion of under five-year-olds had ARI in the two weeks prior to the survey (17.2% in June 2000; 12% in October 2000).

Vaccine-Preventable Diseases

Measles is the third most common cause of registered death in children under five years of age in Northern Iraq. In Center/South Iraq, more than two-thirds of measles cases are now occurring in older children who most probably escaped immunization. Reports of other vaccine-preventable diseases such as Pertussis (whooping cough) and diphtheria have also risen (see Figure 16). The last Pertussis epidemic occurred from June-December 1996 with 40% of those affected under five years of age. Almost 20% of children ages 1-4 years were not immunized. Pertussis has no seasonal pattern but tends to occur in summer/autumn months (June-October), while diphtheria tends to occur more in colder months. There were 2,312 cases of Pertussis reported in 2001.²⁷

Figure 16: Vaccine-Preventable Diseases, 1989 - 2001

Three components of a surveillance system were in place at the end of the 2003 war.²⁸ In the three northern governorates, the usual system of notifiable disease reporting remained operative. In most of the Center/South, weekly reporting was set up from sentinel hospitals and clinics to make up for the collapse of regular reporting. In most of Baghdad, it was possible to set up daily sentinel reporting.

MoH sentinel site reports following the war show a threefold increase in the proportion of all visits to health facilities due to diarrhea compared to the same period of the prior year (WHO, and see Table 7). It is not clear if this represents a rise in the number of serious diarrhea cases, as the total number of visits is less than the prior year's. ARI and diarrhea constitute the most frequent current reasons for medical consultation. Typhoid fever, cholera, Pertussis, measles, and visceral leishmaniasis cases have also been reported, but at what are considered to be within seasonally endemic levels (WHO).

Table 7: Cases of Reportable Diseases, 1989 -2001

Disease	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Amoebic Dysentery	19,615	32,957	58,311	61,939	62,864	76,864	668,064	543,295	329,950	264,290	609,920	643,251	652,314
Brucellosis	2,464	2,816	13,106	14,546	14,989	15,476	19,040	7,531	8,911	5,305	7,083	8,551	9,166
Cholera	-	-	1,217	976	825	1,345	1,216	831	486	2,560	2,398	757	560
Coetaneous Leishmaniasis	1,829	1,894	8,233	8,779	7,378	6,662	7,703	7,606	2,939	2,985	1,261	955	625
Diphtheria	96	168	511	369	239	132	119	258	290	160	142	34	32
German Measles	514	693	2,848	1,663	928	584	338	23	17	65	4,127	1,612	91
Giardiasis	73,416	113,222	501,391	596,356	602,011	587,924	689,113	584,621	605,170	509,050	535,140	542,365	563,642
Hemorrhagic Fever	38	42	196	65	48	39	48	48	11	2	2	4	4
Hydatidosis	370	406	1,787	1,991	2,108	2,520	2,908	184	257	345	440	521	752
Malaria	3,428	3,924	7,105	5,535	4,581	19,266	59,931	32,199	9,594	6,996	3,212	1,154	185
Measles	5,715	7,524	11,358	20,160	16,399	10,646	7,134	240	556	25,818	9,920	726	453
Meningitis	2,559	1,810	5,792	4,534	3,772	3,128	2,853	691	1,202	1,025	656	574	501
Mumps	9,639	15,963	22,718	23,883	46,961	39,642	29,195	14,817	49,556	35,881	25,554	18,720	2,780
Neonatal Tetanus	42	393	936	233	171	89	64	74	73	36	49	37	21
Pertussis	368	489	1,537	1,601	767	526	475	1,179	535	1,271	466	407	2,312
Poliomyelitis	10	56	186	120	75	53	32	20	31	29	75	4	-
Rabies	25	37	256	84	49	32	34	23	6	14	27	14	7
Scabies	-	198	1,892	7,956	10,354	13,832	18,209	39,146	40,360	43,580	35,343	23,217	21,512
Tetanus	32	87	933	98	64	38	31	12	25	26	19	17	21
Toxoplasmosis	372	512	2,223	2,745	3,145	3,899	4,640	2,768	2,960	2,036	3,506	3,834	3,959
Tuberculosis	14,350	14,735	13,527	12,355	19,005	19,581	26,882	29,196	26,607	29,410	29,897	25,251	11,413
Typhoid	1,812	2,240	17,524	19,276	22,688	24,436	26,634	15,238	14,464	19,825	23,392	24,614	21,356
Viral Hepatitis	1,816	3,228	11,135	13,766	16,801	11,296	15,557	29,803	18,501	12,142	13,150	8,879	10,605
Visceral Leishmaniasis	491	576	3,713	3,866	3,817	2,787	3,110	3,434	794	874	744	2,611	2,893

Source: MoH Notes: After 1991, figures do not include the three Northern Governorates. Diseases in Italic and shaded are Vaccine Preventable.

The Health System

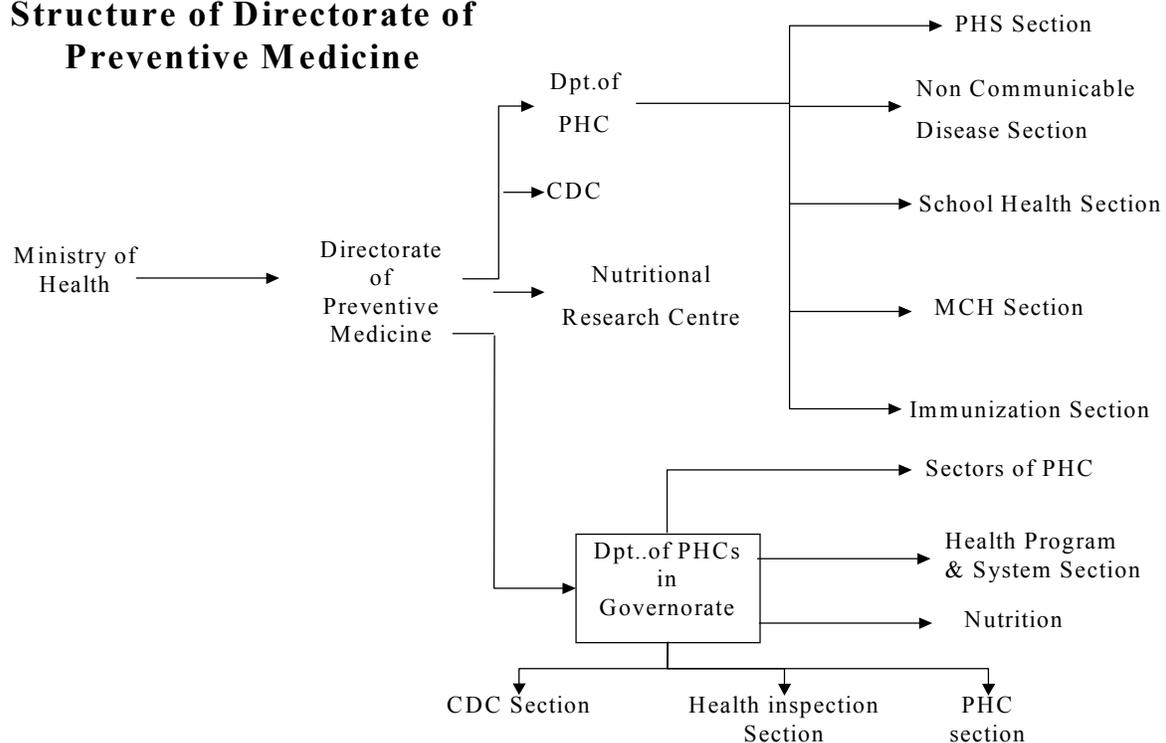
Preventive Health Administration

The Directorate of Preventive Medicine includes the following offices:

- Primary Health Services
- Tuberculosis Control Institute
- Nutrition Research Institute
- Communicable Disease Control Center
- Public Health Laboratory
- Sanitary/Health Inspections

The Ministry of Health is composed of 17 governorate offices (also called Directorates of Health-DoH) and four similar offices for areas of Baghdad. The geographic offices direct a total of 86 local Health Sector MoH offices. Sparsely populated governorates have only one Health Sector, while the city of Baghdad had nine. Each governorate is equipped with at least one secondary level hospital.

Structure of Directorate of Preventive Medicine



Services are provided by 269 hospitals (public and private), 1,570 health centers, 308 health insurance clinics, 254 chronic illness pharmacies, and 32 special pharmacies for rare drugs.

The distribution of beds, primary care visits, and doctors is very equitable across all

governorates, but the services offered are often not the appropriate ones for the country's disease profile. Only 550—a third of the country's more than 1,700 public hospitals and health centers—are equipped to provide emergency obstetric care.

The number of Primary Health Center (PHC) facilities per person varied widely, from 4,700 to 39,000 people per facility. This is an appropriate distribution given differences in population density. Visit to public facilities as recorded by the MoH showed a generally equitable distribution around the country. Sparsely populated Saladin had more doctors per population, but fewer visits. There were far more variations among specialized centers, as there are few of these in some outlying governorates (see Table 8).

Table 8: Public Visits per 1,000 Persons, 2000

	Emergency	Specialized Centers	PHC Centers	Total
Baghdad	151.6	123.2	671.6	946
Basra	212.7	27.3	726.2	965
Ninewa	188.7	28.5	947.8	1,166
Maysan	78.3	13.4	708.9	800
Qadissiyah	195.4	23.4	650.8	869
Diallah	86.8	105	548.3	740
Anbar	130.9	1.3	513.5	646
Babil	161.7	24.3	348.1	388
Kerbala	145.7	28.7	355.6	531
Tamim	203.4	59.6	1,040.8	1,304
Wasit	120.1	208	723.4	1051
Thiqr	130.5	0.8	551.6	683
Muthena	171.3	47.4	468.3	586
Saladin	105.4	4	961	1,070
Najaf	81.4	0.5	388.1	470
All	147.5	42.5	650.2	840

Personnel

The doctor to population ratio increased from 1977 to 1998 but was still low at 4.7 per 10,000 compared to most other countries in the region with ratios above 10 per 10,000. The ratio of nurses per population was always low, and fell off precipitously after foreign workers left in 1990. There are 5.2 nursing staff per 10,000 people, meaning that there is about one nurse per physician. In most countries there are 3–6 nursing personnel per physician. More than a third of the physicians are specialists, while less than a third of the nurses were trained in post-high school programs.

Table 9: Distribution of Medical Personnel, Center/South, 1999

	Physicians Specialists	Physicians General Practitioners	Dentists	Pharma- cists	Nursing Assis- tants	Dresser s	Para- Medical Staff
Hospitals	2,547	5,503	168	1202	10,342	1,389	34,701
Primary Care	481	2,301	1925	842			

Sources: CSO and MoH

In the Center/South governorates in 1999, the physician to population ratio was 1 per 1,926 persons, or 52 per 100,000 persons (see Table 9). Neighboring Jordan had a physician to population ratio four times greater. There was one professional nurse for 24 physicians, two professional nurses per 100,000 persons, and 50 auxiliary nurses per 100,000 persons. During the same time, Jordan had 70 times more nurses and twice as many auxiliary nurses. Overall, in 1999, total health workers to population in the Center/South region of Iraq was 11 per 10,000, while in Jordan there were 60 per 10,000.

Table 10: Human Resources in the Health Sector per 100,000 Population, 2002

Physicians	53
Dentists	11
Pharmacists	8
Nurses	2
Nursing Auxiliaries, Aids, Others	44

Table 11: Nurses and Doctors per 100,000 Population, 2000

	Specialists	General Practitioners	Total Doctors	Nurses	Nursing Auxiliaries	Total Nursing Staff
Baghdad	16.4	44.8	61.2	14.3	15.9	30.2
Ninevah	9.0	28.4	37.4	6.8	19.7	26.5
Basra	11.5	36.0	47.5	9.8	32.6	42.4
Thi-Qar	7.1	15.8	22.9	10.4	24.2	34.6
Babylon	13.9	36.7	50.6	13.5	24.6	38.1
Diala	11.5	23.6	35.1	16.8	18.3	35.1
Anbar	13.5	32.3	45.8	9.1	22.1	31.2
Salah Al-Din	15.0	27.9	42.9	1.6	15.6	17.2
Najaf	14.8	33.0	47.8	8.3	23.4	31.7
Wasit	14.3	21.9	36.2	2.0	5.1	7.1
Qadisiya	10.8	30.4	41.2	4.8	29.3	34.1
Tameem	17.8	31.4	49.2	6.7	20.2	26.9
Maysan	8.3	15.2	23.5	9.0	27.2	36.2
Kerbala	14.6	35.4	50.0	10.9	48.2	59.1
Muthana	11.8	23.4	35.2	.2	12.1	12.3
Suleimaniyah	27.7	44.2	71.9	62.2	141.8	204.0
Erbil	7.3	37.5	44.8	32.6	110.5	143.1
Dohuk	5.8	48.6	54.4	7.6	88.2	95.7
Total Iraq	13.5	32.2	47.7	14.0	38.1	52.1

Far more problematic is the situation in nursing. In Iraq, there were almost the same number of nurses and nursing auxiliaries, as there were doctors (see Table 10). In most countries, there are 3–6 nurses and nursing auxiliaries per physician. Among nursing staff, few were professional or trained nurses. Iraq has more than twice as many physicians as nurses; there should instead be at least two nurses per physician. Among all nurses, only a small fraction are graduated from university nursing schools; more than 80% of trained nurses are graduates of high school or post-high school nursing institutes. Only a handful of those trained in other countries have any background in public health. A large cadre of well-trained nurses will be needed to retool the health system to primary care, health education and promotion, and targeted disease prevention programs.

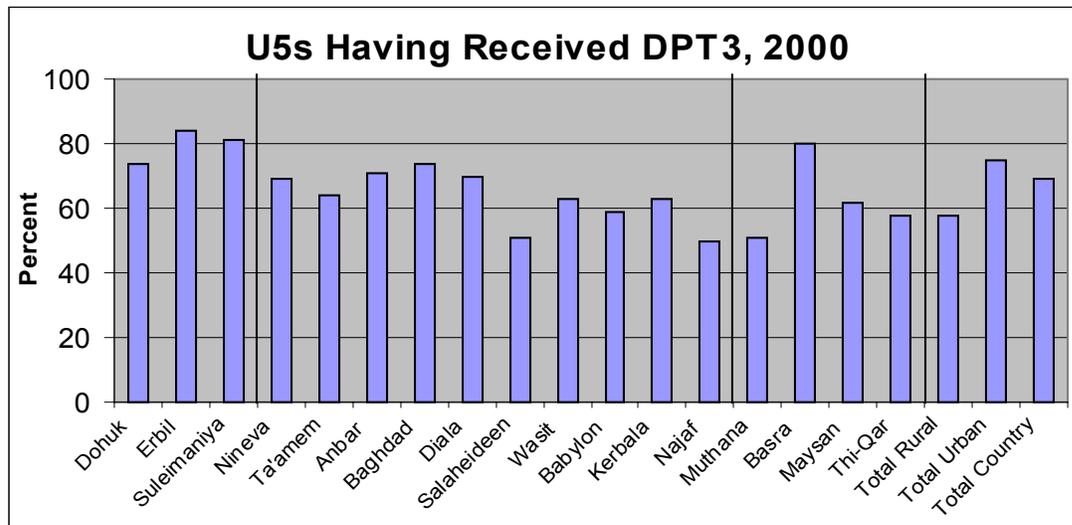
Entry to medical school was partly determined by location of residence. This helped to insure the equitable distribution of all doctors and specialists throughout the country. From the highest to lowest doctor to population ratio governorates, there was only a twofold difference (see Table 11).

Vaccines

Vaccination coverage for childhood illnesses overall fell dramatically in the early 1990s from higher pre-1991 Gulf War levels. Good data are only available for the period starting in 1998, examined later in this document.

By 1996, vaccine availability began to improve, and by the end of the decade, coverage rates had largely recovered or exceeded pre-1990 levels. DPT coverage was higher in the North (80%) than in the rest of the country (17%) by the year 2000 (see Figure 17).

Figure 17: U5s Having Received DPT3, by Governorate, 2000



Immunization coverage rates identified by household survey were higher for BCG (tuberculosis vaccine), OPV (oral poliovirus vaccine), and TT (tetanus toxoid) and lower for DPT (Diphtheria-Pertussis-Tetanus vaccine) than rates estimated by the routine reporting system (see Table 12). Continued reports of large number of vaccine-preventable diseases, a polio outbreak in Northeast Iraq in 1999 (with no further cases reported to date since February 2000), and the fact that half of mothers did not have an immunization card during the 2000 MICS survey suggests that there continue to be great problems with immunization service and social mobilization to motivate public awareness and timely application. The cold chain has been a particular problem in assuring vaccine quality. Most of the equipment was newly purchased by the OFFP, but old equipment included 160 of 710 kerosene refrigerators, 135 of 1,005 electric refrigerators, and 3 of 18 cold rooms.

Table 12: Status of Cold Chain Facilities in Post War Iraq, 2003

Description	Available Before War	Available After War: Working	Available After War: Damaged or Looted	Requirements
Kerosene Refrigerators	684	343	228	438
Electric Refrigerators	547	343	116	380
Ice Lined Refrigerators	195	149	35	118
Cold Rooms	35	17	13	21
Vaccine Cold Boxes	1,207	989	70	402
Vaccine Carriers	7,752	6,533	447	3,885
Ice Packs	37,720	31,210	2,500	22,600
Electric Generators	475	447	57	246
Bimetal Thermometers	4,656	3,385	614	5,558
Fuel for the Kerosene Refrigerators	131,675 lt/litres?	1,500 lt	0	546,600 lt
Fuel for the Electric Refrigerators	4,928,500 lt	9,500 lt	0	1,789,300 lt

Table 13: Vaccine Coverage (Percent), 1998 – 2002

Vaccine	Estimated by Doses Provided					Household Surveys	
	1998	1999	2000	2001	2002	1996	2000
DPT (3 doses)	83	90	86	74	92	74	69
OPV (3 doses)	-	89	86	82	80	73	82
Measles	-	94	93	80	80	80	78
BCG	80	85	79	85	80	97	92
TT (Pregnant Women)					63	75	

Immunization services improved in the latter part of the 1990s, and the reported number of vaccine-preventable diseases declined somewhat. Immunizations stopped at the beginning of the conflict. Disruptions to the electrical power supply compromised the cold chain and most vaccines at PHCs were lost. Vaccines were then either in country or in the pipeline in sufficient quantities to re-start the Expanded Programme of Immunization (EPI) activities, targeting 4.2 million children under-five by mid-July. Only 60% of PHCs had cold chain and security capacity to provide immunizations. A high level of attention in the following months re-established most of the cold chain and delivery capacity. In June-September 2003, 30 million doses of vaccines were provided and 3 million children were vaccinated.

While there has been partial recovery of the vaccination program, it has an excessive focus on the number of vaccines distributed and an insufficient focus on quality aspects of the system. These include the competence of the cold chain, education of mothers on the importance of vaccinations, the promotion to assure that mothers keep an updated health card for each child, and the vaccination of target populations. Only 61 % of two-year-olds had received all vaccine doses according to schedule in 2000. The country has remained polio free for the last 42 months.

Nutritional Rehabilitation

UNICEF created the Targeted Nutrition Program in 1996 in coordination with the Nutrition Research Institute (NRI), the nutrition section of the MoH, and has helped manage the program to date. The NRI is dependent on UNICEF for support of the TNP including supply, transport of HPB, training of workers, and operating funds.

The Targeted Nutrition Program (TNP) has three main components for addressing malnutrition (see Table 13):

- Nutrition Rehabilitation Centers (NRC) in hospitals,
- Primary Health Centers (PHC), and
- Community Child Care Units (CCCUs)

Table 14: Distribution of Nutritional Rehabilitation Centers and Community Child Care Units, 2003

Governorates	NRCs	CCCUs
Anbar	2	221
Babil	6	73
Baghdad	7	332
Basra	7	292
Diyala	6	96
Karbala	2	105
Missan	6	127
Muthanna	3	97
Najaf	3	114
Ninewa	6	250
Qadissiya	4	74
Salah al-Din	6	88
Tameem	1	79
Thi-Qar	4	199
Wassit	4	136
Dahuk	4	91
Erbil	4	116
Suleimania	7	203
Totals	82	2793

Although there are CCCUs located throughout all regions of the country, only those in the North have operated in a stable manner. This was possible in the North because United Nations Organizations (UNOs) and Non Governmental Organizations (NGOs) were able to engage in hands-on supervision and local governments provided stipends for CCCU staff. Although UNICEF and other organizations aim to revitalize CCCUs in the Center and South, in truth they were never that vital, depending mainly on over-taxed schoolteachers who received little supervision and no stipends. Nonetheless, they are the only potentially effective system for reaching families beyond primary health centers. UNICEF estimates that 75% of under five-

year-olds and 50% of pregnant women have visited a CCCU at some time.

NRCs are located in pediatric hospitals and treat severe malnutrition. PHCs have a nutrition unit, which assess malnutrition using weight for height and refer severely malnourished children to the NRCs or provide a card for the moderately malnourished children to receive a supply of HPBs. Both of these institutions have paid professional staff. Both would benefit from training in patient assessment, treatment algorithms, and Integrated Management of Childhood Illness (IMCI) activities.

CCCUs are mostly located in schools and screen children for malnutrition, upkeep growth monitoring cards, and provide health education for mothers in their communities. Teachers in these respective schools, who do not receive any additional payment for administering these services and are therefore considered volunteers, staffed most of these CCCUs. The only incentive they receive is payment for attending training courses provided by UNICEF/NRI, typically \$5 per training day.

UNICEF trainings take place in Baghdad at the NRI. Each TNP manager comes to Baghdad and returns to his/her respective governorate with the information to train other TNP workers. This system is designed for information to filter down throughout the program reaching all TNP workers. It should be noted that in the case of CCCU trainings, only the head worker is officially trained. This system proves inefficient, but is representative of the entire program as most activities and plans are formed in Baghdad and lose significant momentum in application at the governorate level. Although training is billed as 'train the trainer' sessions, there is no follow up and little expectation that further training will occur in the governorates.

International Medical Corps (IMC) and other NGOs attended the initial post-war UNICEF/NRI training in July. The Nutrition Program Managers from each governorate attended this two-day training of which day one was spent discussing HPB and finances. The second day, of which only half the attendees from day one were present, consisted of another discussion for HPB and a short lecture on taking anthropometric measurements and micronutrients.

The NRI has some field presence in the form of monitoring visits, but this is limited as the NRI must request travel funds from UNICEF. NRI travel outside Baghdad requires the procurement of travel funds for each trip from UNICEF; thus, such visits are infrequent.

The NRI had no phone or email access. At the end of August, UNICEF supplied the director, Dr. Khalil, with a satellite phone, which eased some of the burden. However, communication with the field remains a constant grievance of both the NRI and UNICEF. For these reasons, the TNP remains largely unsupervised by the post-war administration.

IMC in summer 2003 distributed copies of 'Environmental Health for Children' from CEHA in Amman to CCCU volunteers and handouts on nutrition/malnutrition, diets, and pictorial instructions on taking weight and height measurements in training sessions in five governorates.

Sanitary Infrastructure

A survey in 2000 indicated that 99.1% and 77.8% of the urban and rural populations respectively used a 'sanitary means of excreta disposal.'²⁹ This perception of 'sanitary' at household level may have been directly related to the presence of in-house toilet facilities. In reality however, the vast majority of septic systems and sewerage treatment plants did not function properly, resulting in overflows of raw effluent into the immediate or distant environments.

Diseases associated with poor sanitation, unsafe water, and unhygienic practices had also increased to alarming rates, contributing to a fast growing problem of malnutrition, morbidity, and mortality of infants and under five-year-olds. Poor sanitation and insufficient access to safe water, particularly at family level (for drinking, cooking, and family and home hygiene) is a key underlying cause of diseases and malnutrition in Iraq. Globally, it is estimated that water and sanitation-related diseases are responsible for about 19 % of all children's deaths.³⁰

Exacerbating the situation is an acute lack of awareness—at all levels—of the relationships between disease and poor sanitation and unsafe water and unhygienic practices, including the necessary life skills to prevent and protect against such diseases. This lack is particularly visible among illiterate mothers and child caregivers. Unhygienic practices for early childhood care and feeding, unsanitary living environment and a poor understanding of the links between poor sanitation, and use of unsafe water and that of diseases, exacerbate the disease burden. There is an insufficient focus on strategies that promote good sanitation, hygienic behaviors, management and conservation of water, especially at the family level and insufficient attention given to collaboration and coordination with health and nutrition sector to combat disease and malnutrition.

Reproductive Health and Birth Spacing

The Maternal Mortality (MM) rate was calculated from demographic survey to be 294 per 100,000 women ages 15–49 years during 1989–1998. This represents a more than doubling of the rate of 117 per 100,000 estimated in 1989. Total fertility in Iraq is estimated a 5.7 which is extremely high. Most maternal deaths occur after delivery (61%) or during pregnancy (24%). Prenatal care or delivery with trained assistance and referral can prevent most of these deaths; 65% of births occur outside of formal health institutions. Traditional birth attendants (TBAs) attended 79% of these births in 1998. The proportion of women delivering without trained assistance increased during the 1990s to 30% in urban areas and 40% in rural areas. About 80% of women reportedly received some kind of prenatal care, but only 60% received postnatal care. Since 90% of newborns receive postnatal care, an opportunity to improve coverage of care among postnatal women exists. Of those women who delivered in public or private health institutions, many received inadequate care because essential drugs were missing, transport to more advanced institutions was poorly organized, or doctors lacked training in emergency obstetric care. It is mainly referral institutions at a district level that have the capacity to attend complicated births; about half of these lack some key resources to provide appropriate care. Women are at increased risk for poor birth outcomes with high rates of anemia (51-70%), short birth intervals (41% spaced less than two years apart,) high total fertility (7.7) and early marriage (40% prior to age 18 years). Some 15–20% of deliveries are at high risk and need advanced

medical support. Efforts are needed to develop or strengthen the referral system to ensure referral of complicated cases to institution that deliver emergency obstetric care.

Only a third of MoH facilities offers emergency obstetric care, and only a third of Iraq's women give birth with a qualified health worker in attendance. Of these women, 15-20% face high risks to their health and need advanced medical support, but referral systems have not yet been developed. This explains the high maternal mortality of 294 maternal deaths per 100,000 live births, which is a much higher rate than in other countries of the region.

There are 502 obstetricians/gynecologists, about 2,000 TBAs, and perhaps 3,000 untrained TBAs. Most of them have had in-service and refresher training. TBAs assist many women who do not have professionally supervised births. There have been some efforts to train and integrate TBAs into the health system. It is reported that this has been successful, resulting in increased referral of pregnant women for prenatal care and delivery services. This effort should be greatly expanded as part of primary care.

Contraceptive prevalence rose from 14–25% nationally, but this still falls far below the average for Arab countries in 2000 of 51%. Rates varied from 5% to 47% by governorate. There are 147 family planning clinics run by the MoH and 46 run by the Iraqi Family Planning Association. Only 550 of the country's more than 1,700 public hospitals and health centers are equipped to provide emergency obstetric care. Addressing the primary health care needs of pregnant women, and the secondary care needs of women with complicated deliveries, will greatly improve birth outcomes and reduce maternal mortality.

Iraq has a good network of MoH institutions that include 3,532 maternity beds. All general hospitals have an obstetric/gynecology department, and each governorate has a maternity-child care obstetric and gynecology department. In 2001, there were 147 family planning or reproductive health clinics, of which 97 were managed by the MoH. Of these, 59 were attached to or were in hospitals and offered some specialist-level and referral care. Another 22 were PHC-level clinics, and 16 were 'popular' clinics (open in the afternoon). The Iraqi Reproductive Health and Family Planning Association (IRHFPA), working in collaboration with other national NGOs, operated another 46 clinics.

In 1996, 78% of pregnant women reportedly received some type of antenatal care. Less than 60% of women are currently covered by tetanus immunization. A MoH survey found that only 17% of medical staff are conversant with the relationship between adequate birth spacing and maternal health. Less than 50% of health care facilities are capable of providing emergency obstetric care. The referral system has broken down as a result of poor pregnancy monitoring, poor linkages between PHC and specialized hospitals, lack of telecommunications, poor ambulance services, and the lack of security.

Interventions

What activities could potentially contribute the most to rapid reduction of IMR and U5MR in Iraq now? Only several interventions are widely believed to be of major importance among targeted interventions.³¹ Several have little relevance in Iraq, including malaria prophylaxis and HIV treatment, as the incidences of both diseases at this time are quite low. Some of the others are difficult to implement more widely in Iraq; variables influencing implementation will be examined below.

Breastfeeding

Breastfeeding among infants ages zero to five months is perhaps the most important potential activity in reducing mortality rates in the developing world. Infants in this age group who are not exclusively breastfed in countries with low income levels or poor sanitary conditions have a twofold risk of death, and those not breastfed have a five- to sevenfold increased risk of death, mainly from diarrhea or pneumonia. Breastfeeding has also been shown to be effective among children ages 6 to 11 months. As shown previously, although most women do breastfeed the prevalence fell in the 1990s, exclusive breastfeeding fell even more, and diarrhea and pneumonia are the most common killers. Iraq has both poor sanitary conditions and low income levels. The impact of breastfeeding promotion is thus likely to be great and rapid in reducing mortality in Iraq. Breastfeeding promotion could reduce mortality by more than 10%.

There are several cultural factors that facilitate the adoption of this behavior:

- UNICEF reported its education interventions to be very effective in 2000 in increasing the rate of exclusive breastfeeding
- Breastfeeding is historically a widely accepted and a normal part of Iraqi society, with the decline in breastfeeding being only a recent historical phenomena
- There are clear instructions in the Koran to support breastfeeding; the potential to mobilize the support of religious and community leaders in addition to health authorities for breastfeeding promotion is great

Breastfeeding promotion activities should focus only on early initiation of breastfeeding (within one hour of birth), exclusive breastfeeding until six months of age, and continued breastfeeding with appropriate complementary feeding until two years of age.

Improved Delivery Care and Birth Spacing

Two other interventions have a potential to reduce mortality by as much as 10%, based on comparable international experiences. One of these is improved delivery care, including the provision of resuscitation, temperature management, clean delivery, and antibiotics for premature rupture of membranes. The training, supervision, communications, and co-ordination needed to provide these services well are nearly identical to the activities needed to reduce maternal mortality. Given Iraq's extensive and well-distributed physicians and clinics, it would

be possible to capitalize on existing resources to improve the care and coordination to yield far greater outcomes. But such coordination has never occurred in the Iraqi health system and cannot be created overnight. For such a system to evolve, it will take regional experiments and the evolution of practical systems for in-service education and the referral and counter-referral of patients. Furthermore, since only about two-thirds of all deliveries are currently attended by health professionals including trained TBAs, the system will have to grow extensively before this contributes to mortality reduction.

Improving preconception and antenatal care should involve iron/folate and iodine supplementation, immunization against tetanus, management of sexually transmitted diseases and urinary track infections, hypertensive disease, and counseling on nutrition. Improving delivery care should involve management by a skilled birth attendant and timely access to essential obstetric and neonatal care for complications. Improving postpartum care will involve improved medical management of the well and sick newborns and mothers. A 'package' of priority activities in this field should be defined. This can be based in part on the Maternal Mortality Reduction evaluation done by Mailman School of Public Health in 2001.

Oral Rehydration Therapy

The third major intervention with potential to reduce mortality by more than 10% is ORT. ORT has slowly become common and well accepted in Iraq but its use is far from universal; many physicians do not provide appropriate care and depend instead on misused antibiotics, and many mothers do not know how to administer ORT well. Getting greater benefit from ORT in Iraq will depend on expanding access to the therapy and improving PHCs, and, more importantly, will take population-oriented health education on identifying cases, providing appropriate ORT, and maintaining nutritional support. Effective education for early recognition and referral to in-patient care for a small portion of all cases must be developed.

Complementary Feeding

Several other interventions can reduce mortality by more than 5%. Despite an approximately 50% decline in malnutrition among children since 1996, chronic malnutrition remains high. Malnutrition spikes first at 6-11 months, when weaning occurs for most children. Though few deaths may be directly due to malnutrition, the fraction of disease attributable to underweight in a review of 10 studies was 61% for diarrhea, 53% for pneumonia, 45% for measles, and 53% for other infectious diseases. Similarly, although the rate of low birth weight is probably less than half the 24% frequently cited, it is still very high and must be responsible for a large portion of all young child deaths. These moderate to high rates of malnutrition are all the more notable for occurring in a country with relatively high levels of rations provided to virtually the entire population suggesting a misdistribution of calories within households. While some of this may be responsive to health education, changing food patterns and family eating habits is notoriously slow and difficult. Education can make a major difference on age and type of weaning foods. Prenatal health care can improve maternal nutrition. These are the easiest points for rapid intervention to improve child nutrition. Apart from these activities, the programs developed by

the CCCUs to monitor child anthropometry and to provide HPB is believed to provide about a 10% calorie supplement to young children. The program and the biscuits are well accepted. Although such a program provides poor targeting for those children at greatest need, until household standards of living improve and the distribution of food within the family changes, this program provides an important safety net and should be maintained or expanded.

Together, these activities—complementary feedings, improved weaning, and a reduced rate of low weight births—have a potential to reduce mortality by more than 10%.

Micronutrients

Children with vitamin A deficiencies have more than a 20% increased risk of dying from diarrhea or measles. Zinc deficiency increases the risk of diarrhea or pneumonia by more than 10%. Supplemental distribution of vitamin A and zinc have been tried with some success in recent years in Iraq. Like the HPB program, the nutritional supplements are well accepted, and an infrastructure for their delivery can be found via the CCCUs and/or periodic vaccination campaigns. A national food policy to target vulnerable groups (pregnant and lactating mothers in addition to malnourished children) with supplementary feeding programs is needed. Vitamin A, iron, and zinc together could reduce mortality by 5-10%. Fortification of many food products can be quickly developed or required for imported products. This includes flour fortification with iron/folate and oil fortification with vitamin A. Distribution of zinc and vitamin A is also possible at CCCUs and immunization posts.

Immunizations

Measles is a major contributor to child mortality in countries with inadequate coverage of biologically viable vaccines. Vaccination rates for measles have been around 80% in recent years, and there has not been an epidemic of measles since 1999. Furthermore, this is the one area of preventive health that has been most successful since the 2003 war, both because all parties recognize the political and technical value of immunizations and because there happens to be an experienced Center for Disease Control (CDC) immunization leader among the Coalition Provisional Authority (CPA) staff in Baghdad. UNICEF currently estimates coverage of 40–70% for vaccines. This is the product of catch-up activities following an initial period of three months with no vaccination activity. It is hoped that by use of further campaigns and catch-up activities vaccine levels among under two-year-olds will be raised to 70–80% by the end of 2003. The potential for late (catch-up) vaccination or poor viability because of weaknesses in the cold chain nonetheless shows the need to strengthen parent education to demand measles vaccine and to improve the monitoring and coordination of the vaccine provision system.

Once the system has been rehabilitated to ensure high rates of measles immunization, attention should turn to other vaccine-preventable conditions. Expanded utilization of Hib vaccine and TT, along with improved measles vaccinations, can contribute to a 5% reduction in mortality.

Home Hygiene and Health Practices

Home hygiene promotion has been starkly missing from almost all planning to improve health in Iraq for more than a decade. Yet even while waiting for the gradual improvement in the supply of clean water and the disposal of wastes, much can be done now at the household level.

Combined, the promotion of hand washing before handling food and after defecating, of safe water storage, of boiling of water before consumption, and of cleaning of vegetables and the administration of chlorine and flocculents could reduce mortality by 5–10%. Appropriate home treatment of diarrhea with ORT, continuation of breastfeeding during illness, increased feeding following illness to enhance recovery, and identification when treatment is needed for respiratory illness can also be reinforced in the home setting.

Antibiotic Treatment

Finally, improved treatment by physicians for diarrheas caused by dysentery or typhoid and improved care for children with pneumonia could make a contribution of 5–10% to reducing mortality. This would take both retraining on the part of clinical staff and health education (to seek timely and appropriate care from health professionals) among the general population.

The appropriate administration of antibiotics for diarrhea and pneumonia requires both training among primary care practitioners and effective referral systems for a small number of patients requiring in-patient care.

Together, the interventions identified above have the potential to reduce by 50–75% the number of deaths among young children in Iraq. Table 16 presents a recommended staged implementation of these interventions.

Table 15: Staged Implementation of Interventions

Intervention	Immediate Actions	Subsequent Actions
BREASTFEEDING	*Distribution of Written Information *Billboards, Radio, and TV Spots	*Educating Community Leaders *Activating CCCU staff *Legal Statute to Control Formula *Research to Monitor Breastfeeding Weaning Foods, etc.
IMPROVED DELIVERY CARE AND BIRTH SPACING	*Distribution of Written Information *Equipping Units for Emergency Obstetric Care *Train Midwives	*Training Practitioners *Communications and Transport for Referral *Educating Community Leaders
ORAL REHYDRATION THERAPY	*Distribute ORS Packets to Households *Distribution of Written Information *Billboards, Radio, and TV Spots *Establish Treatment Algorithms	*Activating CCCU staff *Research to Monitor Care-Seeking Behavior, etc. *Communications and Transport for Referral
COMPLEMENTARY FEEDING	*Distribution of Written Information on Reducing Low Birth Weights *Establish Treatment Algorithms	*Activating CCCU staff *Research to Monitor Intra-Home Food Distribution Practices *Communications and Transport for Referral
MICRONUTRIENTS	*Distribute Vit A, Folate, and Zinc Tabs to Households	*Activating CCCU staff *Research to Target Vulnerable Groups
IMMUNIZATIONS	*Distribution of Written Information *Strengthen Vaccination Programs	*Activating CCCU staff *Research to Target Vulnerable Groups
HOME HYGIENE AND HEALTH PRACTICES	*Distribute Chlorine, Soap, Water Containers, and Flocculents *Distribution of Written Information	*Activating CCCU staff
ANTIBIOTIC TREATMENT	*Establish Treatment Algorithms	*Training Practitioners *Communications and Transport for Referral *Research to Monitor Treatment Behavior

Limitations and Opportunities

Limitations

Some limitations are obvious and dramatic to anyone working in the field today. Most prominent is the lack of security that has made every health system development effort slower, more limited, and more costly. The lack of security continues to result in shortages of key goods, hesitance to visit field sites for training and supervision, limitations in the number of international consultants in Iraq, and less public participation in the health system. Fewer potential beneficiaries take part in the services and system for fear of going out in public.

Problems of infrastructure are intimately related to problems of security. Limited transportation and telecommunications services make coordination, supervision, and training far more difficult. This is especially the case in remote rural areas, which—lacking telephones, radios, and Internet—often learn of health system changes only by word of mouth. Shortages of electricity and water services limit the quality of services and become a focus for health workers. Lack of communications retards the development of basic health care information systems. Health promotion often seems like an extravagance when equipment does not work because there is no electricity; nutritional supplements and prenatal care may seem unnecessary when one is busy trying to avoid being shot or kidnapped.

These post-war conditions mask deeper problems that exist in the health system. For more than 13 years, the health system has suffered from a low level of maintenance and investment. The OFFP reduced the deterioration of the system, but not nearly as much as would be suggested by the numbers of facilities renovated, etc. The entire OFFP system in the Center and South continued to depend on, and reinforce, a highly centralized system that lacked transparency.

Lack of investment in the development of human capacity was even greater than the lack of support for infrastructure. Some of what was called ‘war-related destruction’ was the robbing of health facilities by health workers for financial gain; some of the ‘lost records’ never existed or were destroyed to cover up administrative weaknesses. Some of the data in the health system has been routinely falsified in recent years, as health system leaders, who were mainly interested in the appearance of work, had neither the skill nor interest in using these data to manage the health system. Leaders at all levels are unprepared to determine local priorities or evaluate programs; in the past, a few people at the remote central level of government made all of these decisions. None of the people in positions of leadership have training in management, supervision, data collection, or data analysis.

Primary care and community health activities will require a cadre of skilled nursing staff. Nursing in Iraq has been extensively damaged over the last two decades. Many nursing leaders have emigrated, the numbers of nurses working in professional roles has declined, and nursing to most people has become a menial task. Low status and poor image of nursing, low pay, poor

working conditions, and lack of autonomy and cultural constraints for women are found in many countries. Nursing in Iraq has the additional burden of being a field where the majority of practitioners were foreign workers who have left and where nurses do not enjoy the minimal perks available to physicians, such as uniforms and meals.

Iraq has less than a handful of individuals trained in any aspect of public health, and most of these are in the fields of tropical medicine. Social sciences, health administration, and epidemiology are virtually unknown fields in Iraq. The CPA team is severely limited in its ability to supplement these areas, as only a few of their staff have any training in these fields relative to conditions in developing countries.

Another limitation is that there may be cultural factors that limit the ease with which some behavior changes can occur. The centralized structure of health services in the past increased a focus on what doctors and the government could provide, rather than what people could do for themselves for health. The survival and security burdens are already great on families, and receptivity to positive changes that require further initiative may not be great. A political focus since 1990 on the ill effects of external threats, from sanctions to depleted uranium, has prevented the emergence of public awareness that Iraqi's actions will be the major influence on most health threats. Changes in cultural habits related to food are always slow and deeply ingrained in a culture.

Opportunities

The high rates of bottle feeding or breastfeeding without supplementary foods created an unusually large group of children at especially high risk for poor nutrition, depressed immunologic levels, and increased vulnerability to diarrhea and acute respiratory infections. This situation worsened especially when access to high-quality foods was limited, access to curative medicines was inadequate, and the quality and quantity of water was poor. Mobilization of the health and welfare systems to ensure maternal and child nutrition through improved weaning habits, expanded breastfeeding promotion, preferential access to food for women and children, and simple early intervention to reduce morbidity through diarrhoea and upper respiratory infections were needed in the 1990s. ***Such mobilization in education, and health promotion were virtually absent since 1990; they can bring rapid and dramatic results now.***

A sizable informal economy developed during the years of war and sanctions. This has put disposable income in many people's pockets, and creates the opportunity for social marketing. Iraq had a high rate of urbanization, relatively high literacy rates, good access to doctors in a public system of care, and widespread mass media. In a re-oriented health system, these resources can be used to address the major health needs of the population far more effectively by targeting families and communities with information and education. There are important lessons to be learned from the failure to reorganize the health system in 1997, when OFFP funds could have been used to develop a more appropriate system of health services and promotion. Similar mistakes should be avoided now, especially with the complete change of the previous regime and a new MoH administration.

The Iraqi government resisted reorganizing services and administration. The Iraqi national consciousness of ‘sitting on a sea of oil’ also mitigated a culture of adaptation to what became a severe and sustained capital shortage. Major changes in the focus of the health system were needed to encourage breastfeeding, promote measles immunization, introduce appropriate complementary foods, screen and weigh children, provide supplementary rations for those in need thereby providing micronutrients vitamin A, iodine, and iron, and focus on simple and early interventions for diarrhea, ARI, and malnutrition. Systematic efforts to change this hospital/doctor behavior should be begun now, through detailed analysis of the epidemiological conditions of the country and training of a new generation of health leaders in public health.

Iraq pledged to adopt the Primary Health Care approach in 1978 but has always had a centrally run, vertically administered health system focused on developing hospitals and medical specialists to the exclusion of primary care services. But there have been important exceptions, where elements of primary care were integrated into the health system and proved to be effective, efficient, and well accepted. These included subsidies to encourage more childbearing and for a child survival campaign that involved 1,000 mobile outreach service teams in rural areas in the 1980s. Campaign priorities included breastfeeding promotion, diarrhea treatment programs, immunization campaigns, outreach for TB care, and the building of a large network of Primary Health Care Centers. Primary health care services were reported to be within reach of 97% of the urban population and 71% of the rural population. Other developments included systems to support ORT in the mid- to late 1990s, and child weighings and the distribution of supplemental HPBs in the late 1990s.

Despite the many limitations regarding nursing and its ability to contribute to primary health care development, a strong educational base for nursing education exists in three universities. Military nurses, now being integrated into the public system of hospital care, have far higher skill levels than nurses in the public system. National leaders, NGOs, and UN organizations universally support investments in upgrading nursing.

Iraq has demonstrated strong organizational ability to deliver services prioritized by national leaders. It also has an excellent record at distributing key goods to households throughout the country via the ration system, developed under unfavorable conditions in the 1990s.

A positive development in information system policy occurred in response to the polio epidemic of 1999. To improve immunization coverage and identify cases more effectively, the Division of Preventive Medicine started to use EPI-INFO software in 2000 and in early in 2003, the Division initiated the automation of data entry, analysis, and reporting for communicable diseases.

Iraq inherited from the previous regime a relatively equitable distribution of doctors and health services in a predominantly public system of care. User fees were successfully introduced in 1997 and can now be utilized to limit demand for inefficient services in favor of more effective public health/primary health care approaches. The near total absence of use of mass media for health education creates a ripe opportunity to capitalize on this ‘clean slate,’ especially with the explosion of media options since the end of the 2003 war. The lack of a central authority figure creates the opportunity to build local integrated demand structures for health care, to promote the role of community leaders and opinion shapers, and to engage communities and families in

health promotion.

Per capita public health expenditure was projected by WHO in 2000 as \$65 public and \$40 private. CPA planning now assumes \$70 total health expenditure based on \$1,000 annual per capita annual income, of which \$56 is from public sources. Current funding by the United States covers only about half of that amount for 2003. As of late October 2003, funding pledges for 2004-2007 appeared high, totalling \$2.8 billion for the health sector. Thus, unlike most post-war reconstruction situations, there are potentially funds to carry out many priority programs. But due to limited short term flows of funds and limited ability to absorb the funds on offer, only about \$70 per capita is likely to be available to the health system in 2004. This will be the highest level of funding available to the health sector since 1990, but it will be a very small sum to achieve a goal of rehabilitating the doctor- and hospital-based curative system in place at that time. Therefore, attention should be focused first and foremost on community health promotion, health education of the general population, orientation of primary care practitioners, and establishment of effective referral mechanisms for a small number of patients to in-patient care.

Delivery Strategies

Most of the major health problems facing Iraq can be addressed either through health education, primary health services, or both.³² Today in Iraq, behavior changes have more potential to contribute to mortality decline than professional medical interventions. These especially include hand washing, water purification at the household, breastfeeding, and complementary feeding. Even activities requiring professional medical technologies such as ORT, vaccinations, care for ARI and safe birthing practices, will work more effectively if health education facilitates good quality care.

It is essential to invest in human capacity to cope with given situations, rather than to focus solely on capital goods and supplies for the health system. This helps to ensure the appropriate use of investments, and helps to provide maintenance and supervision, which maximizes the benefits from existing supplies.

Health Education

There is little tradition of mass education in Iraq to build on. In the 1990s, most families learned to manage diarrhea cases in the home with ORT. The benefits of immunization have also become more widely appreciated and popular. After a drop in exclusive breastfeeding rates with the introduction of formula in the rations in 1996, a rebound in exclusive breastfeeding has occurred since 2000, when UNICEF began promoting breastfeeding activities. But UNICEF surveys show that most mothers are not aware of appropriate weaning ages and complementary weaning foods. Similarly, most mothers do not know the danger signs when a child should be taken for medical care during an episode of ARI or diarrhea.

The major initial change needed is in the culture of health education. The MoH has had a variety of education programs on the books via the Department of Health Education, but most of these involved little more than written instructions. This traditional approach assumes that people mainly lack the information to change behaviors. It has been found in other countries that the main motivators for health behavior changes include identifying with change agents or their symbols, envisioning living well when behavior has changed, and supporting the values implied by the change process. The provision en masse of limited amounts of information may be an additional tool if these motivating factors are in place.

The Department of Health Education is linked to all governorates in Iraq to all governorates in Iraq through the health education units in the Directorates of Health. Prior to the 2003 war, the department trained health workers in production of TV spots and other information-education-communication (IEC) materials, in photography, and in health education techniques. There was a school-based 'action-oriented education program' in 5% of primary schools, and a monthly health bulletin for health updates. In Primary Health Centers, the department established some health education corners and trained directors on communications. Surveys were conducted on:

- the knowledge and attitudes of mothers regarding HPBs
- the IEC materials in PHCs.
- the school environment and knowledge and practices in the schools included in the ‘action-oriented education program

Educational material produced by the department included:

- folders on immunization, hygiene, breastfeeding, and complementary feeding
- posters on immunization, complementary feeding, TBAs, and diarrhea
- TV spots on PHC programs, hygiene, communicable diseases, and environment
- TV spots on national immunization days
- flip charts for health education corners
- booklets on nutrition and breastfeeding

To change the traditional approach to health education and to develop large-scale health behavior change activities will take a great deal of institutional change and development. New staff should be trained at a Master’s level in health communications and campaigns. Examples of successful activities in smoking reduction and weaning food modification from other countries in region should be studied. Some of the leaders of these activities should become consultants to the program in Iraq. Strategic thinking should be engaged to create a multi-stage plan for the conditions and activities of focus. This will require experimentation and research in related areas by specialists in public health, sociology, and anthropology via pilot studies in order to prepare large-scale campaign activities.

Health science schools and district offices of the MoH should be engaged in this planning and should be encouraged to experiment locally in order to draw upon specific local cultural factors and to find effective approaches. This should include the engagement of local religious or social leaders for health promotion, identification of Iraqi organizations that can best spread health messages to their constituents, and experimentation with the use of rapidly evolving media of all types.

Religious leaders may provide cultural support by focusing on Koranic admonitions against abuse of the body and uncleanness, the promotion of breastfeeding, and male support for pregnant and lactating women. Renovation of school curriculum creates an opportunity to relate themes of health and well being to the lives of children.

Social changes in 2003 may facilitate the popularization of health education. The explosion in access to print and TV media creates more opportunities for dissemination. Competition among these outlets can be used to develop loyal audiences. De-legitimization of the former centralized state puts more responsibility on individuals to decide how to act.

The virtual lack of strategic planning and the near non-existence of the use of media for health promotion creates a ripe environment to start health education in child survival now. Well-chosen activities are likely to be quite successful in the new open, participatory, decentralized social environment now developing in Iraq. A decreased focus on national leaders and an opening of the private sector are consistent with the development of individual responsibility and

involvement in health. Strengthening of primary care services and the development of more effective targeted programs in the MoH will also create new opportunities to use large-scale activities in health education.

Important components of a successful health education program should include:

- consultation with regional leaders
- strengthening of the Office for Health Education in the Division of Preventive Medicine
- organizational collaboration with the Division of Primary Care to use community health workers for health promotion activities.
- the development of multisectoral strategies and priority setting for child health (vs. piecemeal activities that have been carried out to date)

Health education for behavioral change through schools, newspapers, religious institutions and leaders, television, and radio should be developed. Popular education and promotion should be developed in areas of personal hygiene, life skills for adolescents, immunization, breastfeeding, oral health, avoidance of early marriage and short birth intervals, pre and post-natal care, and nutrition. Strong social mobilization is needed for exclusive breast feeding for the first six months, and education on the gradual introduction of complementary feeding, while continuing breast feeding up to two years of age. The importance of infant and young child feeding is paramount as it can prevent and considerably reduce infant and child morbidity/mortality.

Health Professional Education

The separation of the educational system from the medical care service system in Iraq has kept the country from training students appropriately to the health situation of the country and has limited reform. Universities should collaborate with the Ministry of Health, which should orient teaching and research in medical schools.

There is an urgent need to rehabilitate nursing colleges and schools and student dormitories and to provide teaching materials, supplies and equipment. The present three nursing colleges are inadequate. The two other universities with partly developed buildings and faculties for nursing should be assisted in completing and opening their schools. More importantly, these schools' should be refocused to better prepare graduates for roles in the Iraqi health system. University graduate nurses should staff renovated institutional and high school nursing programs. Nursing students should be trained in hospitals and in community settings so that they will be ready to work in these environments upon graduation.

There is a need to organize teaching workshops to develop teacher's skills in health education. In-service education, the use of supervised fieldwork, the development of clinical preceptors, learning laboratories, and the use of return demonstrations should be developed for all health science students. Computer-assisted learning should be instituted. The participation of nursing educators from other countries experienced in these technologies will be essential.

Nurses and health educators from other countries should be invited to serve as visiting professors to upgrade teaching. The two partially developed nursing colleges at Mustansiriya and Basra should be completed and opened. Basic science courses should be integrated, with nursing and other health science students together. Community health rotations should be developed on an interdisciplinary basis. The revolution in information technologies must now reach Iraq in electronic and paper formats. Internet access and use for problem solving must be fostered. A national accreditation and licensure system should be developed, incorporate quality assurance mechanisms for institutions and CME requirements for clinicians.

All of the above recommendations will take years to show impact. In the more immediate period, it is possible to re-orient the schools to in-service education, continuing education activities, and the use of primary care facilities for hands-on learning.

Primary Care

At present Primary Health Centers are staffed mainly by physicians. Almost none have outreach activities, with the partial exception of immunization campaigns. Clinic directors are not aware of the catchment area that they are supposed to serve, do little or no referral, and are unaware of the diseases reported or health service visits by cause in their area.

PHCs would immediately begin to take part in health education activities if health education materials, like posters and other visual aids, were produced nationally and displayed locally. Staff should be trained to take a local census and hold health assemblies in their communities. District MoH offices need to collect data on the number and causes of visits, causes of death, and the number of reportable diseases. Nursing staff need to be trained and employed by health centers to engage in outreach visits to local institutions and homes. Physicians and other staff at health centers need to be trained in patient counselling, treatment of diarrhea and pneumonia, and priorities for prenatal, delivery, and postnatal care.

Most of these efforts will require the collaboration of central and governorate-level government and training institutes. Funds to provide staffing for PHCs should reflect these changes by creating lines for nursing staff (at present there are virtually none) and a local data collector and analyst. Funds need to be devoted not only to medicine and equipment, but to facilities for telecommunications and Internet access as well.

Referral System Between Primary and Secondary Care

A relatively small number of children under five years of age have:

- diarrhea which should be treated with antibiotics
- serious respiratory infections which basic antibiotics will not rapidly improve
- nutritional emergencies that should be treated clinically
- been born under conditions of distress and/or have survival emergencies in the first weeks of life

This relatively small number, nonetheless, accounts for the majority of deaths among young children. There is enough access to health services that most of these children are seen by a physician in time to receive life-saving care. Yet no referral mechanisms yet exist in Iraq to facilitate access to IVs, parenteral nutrition, laboratories for typing and sensitivity, or surgical interventions. While such services are available at most of the country's hospitals, utilization is spontaneous and accidental. On the other hand, hospitals provide services to many people not in need of their care to prevent death. These patients could be treated more effectively via primary care.

The development of referral systems between primary and secondary care must be constructed. They will require the consultation with individuals who have developed such systems successfully in other countries, the strengthening of communications and transport, and the elaboration of simple guidelines for such referral systems in Iraq.

Nutrition

Training workshops to introduce revised recommendations for exclusive breastfeeding, complementary feeding, and feeding of infant and young children to MoH personnel and leading medical educators should be held. Research on food habits and attitudes, including usual food intake, intake outside food basket, beliefs about food and health, nutrient intake and analysis of Iraqi dishes, should be conducted. The potential for expansion of use of CCCUs and the possible roles for NGOs at the governorate level for community-level health activities should be explored. The CCCUs function at present in an irregular fashion and are disorganized in Center/South. They should be renovated as part of a national strategy for community health promotion, and their staff should become paid health promoters.

Ratifying the International Code of Marketing Infant Formula will be essential before removal/replacement of infant formula from the food basket. There also needs to be public awareness education programs on food handling safety, storage, and preparation.

Sanitation

Strategies to provide water and sanitation interventions need to be integrated with strategies used in health, nutrition, and childcare. These water and sanitation interventions should be dovetailed with ongoing programs in PHCs, CCCUs, and NRCs. This may now become possible with the formation of Ministry of the Environment, but is by no means ensured. The collaboration of environmental and public health experts and plans, in coordination between the Ministries of the Environment and of Health, should be initiated now. Leaders of the Ministry of the Environment should be trained in the health impact of their activities and should begin public education campaigns. Universities training environmental scientists in Iraq also should be trained in the health impact of their activities. Above all, Ministry of the Environment leaders must focus not only on the production, but also on the uses of water by end-users.

More needs to be done to assess public knowledge, attitudes and practices regarding hygiene, sanitation, water conservation and protection and to create awareness about diseases associated with unsafe water, unhygienic practices, and poor sanitation and environments. Greater emphasis needs to be given to early childhood caretaker—especially illiterate mothers—around hygiene (handling and disposal of feces, hand washing habits), feeding (food preparation and storage, hand and utensil hygiene), and living environment. These interventions will have a more significant impact on reducing the horrific toll of malnutrition and infant morbidity and mortality than just focusing on delivering large quantities of, often, unsafe water. Schools should also be targeted for integrated water, sanitation, and health interventions, particularly in education and training of life skills for sanitation and hygiene improvement and for water conservation and protection. School children should be encouraged and facilitated to act as ‘agents of change’ to promote hygiene improvement and water conservation and protection in their families and communities. The use of schools as a focus for health education and promotion complements the expanded use of CCCUs to promote community health beyond what is offered at PHCs.

Reproductive Health

Selected hospitals and PHCs should be equipped with new delivery rooms with ultimate targets of one comprehensive Essential Obstetric Care (EOC) Center per 150,000 population and one basic EOC center per 30,000–50,000 population. A referral system for obstetric emergencies, with referral cards for midwives and doctors and feedback on the outcome of the case, should be developed. Existing staff (general practitioners, midwives, and TBAs) should receive refresher training on selected reproductive health topics. Existing uncertified birth attendants should be trained and supplied with delivery kits. Clinical protocols (EOC, intrapartum monitoring, antenatal care, STI syndromic protocols, clinical management of rape survivors, protocols for universal precautions, etc.) should be developed and distributed, and staff should be trained in the use of these protocols.

Birth Spacing

Iraq's has a high fertility rate of 5.7 and has never met more than a fraction of the demand for family planning. Typically, birth intervals are short at less than two years. Birth spacing at three to five years from one birth to the next is associated with a 35% reduction in U5 mortality, reduction in maternal anemia, and a dramatic reduction in maternal mortality.³³ Increasing education and options for birth spacing to between three to five years are thus likely to yield considerable benefit for both mothers and children in Iraq, where U5 mortality, maternal mortality, and anemia are all high.

Improved birth spacing will require public education, the education of health professionals, and improved access to information and supplies for the expanded provision of family planning services in primary medical care practice.

Information Systems

The organization of the health system in Iraq has long been modeled on the epidemiological conditions of other countries (e.g., UK and US). The health system has done little to improve living conditions, and what has been done has been achieved at a high cost. The system should be re-oriented on the basis of the morbidity and mortality pattern of the country. Good information systems and dissemination of the information it yields are essential.

Studies assessing geographic variation were not permitted in previous years. There is an opportunity to obtain and review population-based research for presentation by region and/or by governorates (i.e. MICS 1996 for comparison to MICS 2000) to assess disparity among population groups and by governorate.

A permanent system of monitoring of population health status is needed. This system should include assessment of nutritional status, Knowledge, Attitude, and Practices (KAP) health seeking behavior studies regarding use of medical care services, young child nutrition, hygiene, and treatment of diarrhoea and ARI. A system of monitoring birth weights should be established. Monitoring should be longitudinal in nature, and cross-sectional surveys should only be carried out as part of an ongoing plan for monitoring. Expanded monitoring of access to micronutrients and human micronutrient status is needed, especially with regards to vitamin A, iron, iodine, and zinc.

Surveys should not include an assessment of infant mortality rates at this time. Such an effort would be costly and will only provide information on a period of time that ended two years ago; a good study to determine current rates will need to await greater stability that should exist in three to five years from now.

Short-term monitoring should focus on a few key items that can be traced easily over time. Anthropometric assessment, immunization status, and information on birth weights are key. Numbers and cause of death data from health institutions are relatively easy to collect and highly informative for monitoring.

Planning for Next Steps

Timing of Potential Interventions

Among the major activities suggested, the duration to impact on mortality in Iraq is likely to vary a great deal. This 'time to impact' can influence programming decisions and so is made explicit, even though it is based mainly on the qualitative sense of the investigators. Time to impact implicitly includes time to implementation and the duration before the implementation results in changed behaviors (see Table 17).

Among potential interventions, two groups can be implemented very rapidly. One of these is the re-orientation of existing personnel and activities of the MoH. Most importantly, this includes the publication of treatment and referral algorithms and the production of health education materials by the health education unit. Each of these activities can be facilitated by the development of a comprehensive plan and by the training and supervision for intended change agents. These activities do not require waiting for the elaboration or implementation of these wider interventions and can be initiated immediately. Even just the publication and distribution of treatment algorithms can provide a kind of pilot that implementing partners and others can use. These experiences will assist in eventual training and modification to the system.

The second opportunity for rapid implementation is the distribution of consumer commodities related to health to all households. Such a program can be piggybacked on the food ration system, which presently reaches virtually every household. It can include individualized items, instructions for their use, and related health education materials. Items would include, for example, chlorine and flocculent packets, soap, ORS packets, ceramic filters for water, a container for water storage, and similar goods. Such an intervention would likely create demand for health services and further education, which will dovetail with the other intended interventions.

All of these activities, or planning for them, should be begun immediately. In this way, medium- and long-term activities will be developed in time to continue the advances initiated with the short-term interventions. The shortest-term activities can reach implementation in one to three months from date of initiation, short-term activities in 3–15 months, and medium-term activities will take 15–60 months for implementation.

Some activities can be developed largely from existing facilities and other extant resources. Others will require the acquisition or development of new resources. Guidance is provided on the costs and resources needed to implement the recommended activities (see Table 18). Some activities will be far more costly than others will be.

Table 16: Estimated Time-to-Impact

Subject Area	Activity	Shortest Term	Short-Term	Medium-Term
HEALTH EDUCATION	Develop mass media campaign		X	
	Reorganize MoH education department		X	
	Consult with regional experts	X		
	Train media and religious leaders			X
	Develop Masters in health education			
	Posters, etc., for health centers	X		
HEALTH PROFESSIONAL EDUCATION	Print treatment algorithms for GI/URI	X		
	Rehabilitate nursing colleges			X
	Teacher training in health sciences			X
	In-service education		X	
	Computer-assisted learning			X
	International visiting professorships			X
PRIMARY CARE	Train community health workers		X	
	Train physicians in patient education			X
	Print treatment algorithms for GI/URI Posters, etc., for health centers	X		
	Establish basic data system		X	
	Establish telecommunications			X
	Provide ORT supplies	X		
	Provide vaccines and cold chain	X		
REFERRAL SYSTEM	Establish telecommunications			X
	Establish treatment algorithms	X		
	Identify and supply key equipment		X	
NUTRITION	Mass and health worker training		X	
	Research on food habits			X
	Fund and train CCCU staff for new tasks		X	
	Prevent infant formula imports			X
	Distribute vitamin A and zinc tablets	X		
SANITATION	Train Environmental Ministry staff		X	
	Mass health education			X
	Provision of chlorine, flocculents, etc.	X		
	School health education			X
REPRODUCTIVE HEALTH	Identify and supply key equipment for referral		X	
	Establish telecommunications			X
	Establish treatment algorithms	X		
BIRTH SPACING	Develop mass media campaign	X		
	Consult with regional experts	X		
	Train media and religious leaders		X	
INFO SYSTEMS	Monitor Birth Weights		X	
	Monitor Deaths by Cause			X
	Monitor Reportable Infections		X	
	Establish telecommunications		X	X

Table 17: Resources Needed for Implementation

Subject Area	Activity	Mainly New Resources	Mainly Existing Resources
HEALTH EDUCATION	Develop mass media campaign		X
	Reorganize MOH education dept		X
	Consult with regional experts		X
	Train media and religious leaders		X
	Develop Masters in health education Posters, etc., for health centers	X	X
HEALTH PROFESSIONAL EDUCATION	Print treatment algorithms for GI/URI		X
	Rehabilitate nursing colleges	X	
	Teacher training in health sciences	X	
	In-service education	X	
	Computer-assisted learning International visiting professorships	X	
PRIMARY CARE	Train community health workers		X
	Train physicians in patient education		X
	Print treatment algorithms for GI/URI		X
	Posters, etc., for health centers		X
	Establish basic data system	X	
	Establish telecommunications	X	
	Provide ORT supplies Provide vaccines and cold chain		X X
REFERRAL SYSTEM	Establish telecommunications	X	
	Establish treatment algorithms		X
	Identify and supply key equipment	X	
NUTRITION	Mass and health worker training		X
	Research on food habits		X
	Fund and train CCCU staff for new tasks		X
	Prevent infant formula imports	X	
	Distribute vitamin A and zinc tablets		X
SANITATION	Train Environmental Ministry staff	X	
	Mass health education	X	
	Provision of chlorine, flocculents, etc.	X	
	School health education	X	
REPRODUCTIVE HEALTH	Identify and supply key equipment		X
	Establish telecommunications	X	
	Establish treatment algorithms		X
BIRTH SPACING	Develop mass media campaign	X	
	Consult with regional experts		X
	Train media and religious leaders		X
INFO SYSTEMS	Monitor Birth Weights		X
	Monitor Deaths by Cause		X
	Monitor Reportable Infections		X
	Establish telecommunications	X	

Further Recommended Assessment Activities

For further analysis of intervention needs and strategic planning:

- Assess local and regional differences in morbidity and mortality, resources, and organization through further analysis of existent large databases including MICS 1996 and 2000, the GCHS of 1989, and the World Food Program VAM of 2003.
- Compare and contrast the implications of regional analyses with data from central and district MoH databases to better define needs and opportunities for IMR reduction. Such an analysis should focus especially on socioeconomic differences and education-level subgroups in analysis and draw out the implications of findings for health education and promotion.
- Develop a database of national and local studies and make it available to other researchers.
- Use these exercises to elaborate information tools, such as local mapping, to equip MoH to do routine monitoring.
- To summarize implications for current needs and going to scale, perform a detailed analysis of the successful community health efforts conducted in Iraq by document review and interviews with key informants.
- Engage in field assessments, or coordinate the efforts of other organizations in the field, to assess the current status of end-user water quality and cold chain facilities.

Opportunities for Action by USAID

USAID has a unique ability to stimulate, coordinate, and lead interventions to improve child survival in Iraq. Though there are many NGOs and governmental organizations involved in the Iraqi health sector, there is limited expertise among them to lead such efforts today. By disseminating useful information (including some of the information in this report), USAID can help ensure that the many potential partners in this endeavor are ‘on the same page.’ It can help fund and put focus on the major interventions with potential to rapidly reduce mortality. It can help stimulate pilot efforts in key areas by funding MoH and NGO efforts and help move successful efforts to scale, both directly through its funding and indirectly through on-going monitoring and analysis.

Organizations already funded by USAID can be drawn into these efforts now to share and apply their expertise in developing strategy and programming for Iraq. These might include groups such as the LINKAGES Project and its work in breastfeeding promotion, the MOST Project and its work in vitamin A and iron distribution, and BASICS II and its work on nutrition.

USAID missions already in the region, most notably in neighboring Jordan, have in recent years done successful work and evaluation of projects in areas such as child spacing and breastfeeding promotion. The knowledge of how to do this work, the training and other resources needed to go to scale, and the expertise of regional consultants to those projects can be drawn upon as USAID leads the effort to strengthen Iraqi capacity in these areas.

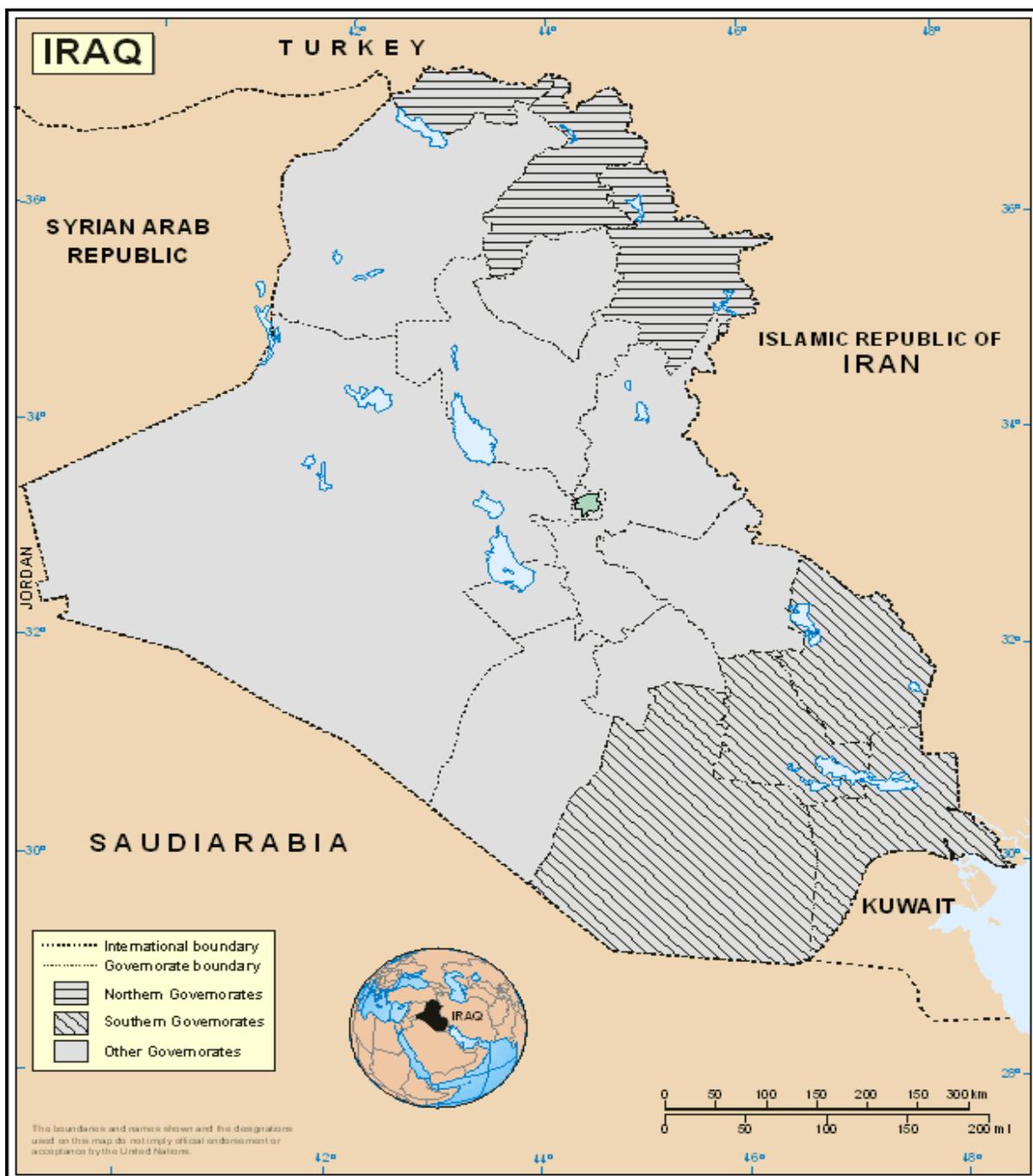
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Northern Governorates include Dohuk, Erbil, and Suleimaniyah
Southern Governorates include Muthana, Basra, Maysan, and Thi-Qar
Other Governorates are included in Central Iraq



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