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SPECIAL REPORT

The Effect of the Gulf Crisis on the Children of Iraq

The Harvard Study Team

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Introduction

THE GULF CRISIS BEGAN WHEN IRAQ INVADED KUWAIT ON AUGUST 2, 1990. TRADE sanctions against Iraq were rapidly instituted. During the six-week war beginning on January 16, 1991, over 120,000 allied sorties were carried out. The massive bombing and ground war resulted in Iraq's capitulation, followed by widespread civil revolt in the country. These uprisings, which caused the displacement of an estimated 2 million people, were suppressed in March and April 1991.

Much international attention originally focused on the military and political ramifications of the Gulf crisis. This was followed by publicity surrounding the devastating plight of the Kurds and Shiites in the border areas of Iran and Turkey. Little attention, however, has focused on the civilian population of Iraq as a whole.

What are the health consequences to civilians of such a series of events? How does high-technology warfare, with the resultant change in military strategy, affect noncombatants? Does precision bombing, with its capacity for highly selective targeting, result in reduced suffering among civilians? What are the effects of economic sanctions combined with armed conflict?

We report here on the effect of the Gulf crisis on the health and health care of Iraqi civilians. We focus mainly on children under the age of five years because they are the most vulnerable and innocent members of the population in times of war and displacement.[1,2] Our team of 10, including 2 Arabic speakers, visited 11 major cities and towns in Iraq from April 27 to May 6, 1991. We divided into smaller groups of two, using independent interpreters and drivers to visit 19 health centers and hospitals, 11 electrical generating plants and 10 substations, 3 water-treatment plants, and 4 sewage-treatment plants. These sites were all chosen independently of the Iraqi government, and we had unlimited access to all facilities except the Ebnil Qatib Infectious Disease Hospital in Baghdad. Only in the two southern cities of Basra and Az Zubayr were team members accompanied by government officials, apparently for security reasons.

We conducted the study under a number of constraints. The inoperative telecommunications system prevented us from arranging meetings or site inspections beforehand, so we were sometimes unable to meet with a particular person without repeated visits. The lack of a telecommunications system also limited the ability of the Ministry of Health to gather information for disease surveillance, the provision of supplies, or other activity required for the normal functioning of a health system. Needless to say, these constraints, as well as our inability to carry out a proper epidemiologic survey, limit us to giving mainly anecdotal reports on the health of the population. We believe, however, that our observations provide key insights into the way modern warfare and sanctions influence the health of an industrializing nation.

Background

Before the Gulf crisis Iraq was an industrializing nation that had experienced major changes over the past few decades in its social structure and health care system. The country was mostly urbanized, with the urban population having grown from 43 percent in 1960 to 73 percent in 1988. The per capita gross national product more than doubled from 1976 to 1987.[3]

Simultaneously, improvements had been made in the health care infrastructure, and the proportion of the population with access to safe drinking water had increased from 66 percent in 1975 to 87 percent in 1985–1987. All of the large urban population had potable water available. Free primary health care reached 93 percent of the population in 1985–1987.[3] In the previous decade, the infant mortality rate had been reduced to 42 per 1000, and the mortality rate among those under five years old was 52 per 1000 in 1990.[4]

As a highly urbanized people, Iraqis were dependent on electrical power for water purification and distribution, sewage treatment, and the functioning of hospitals and health care centers. Iraq was also dependent on imported foodstuffs, which accounted for 70 percent of its food before the recent conflict.[5]

Damage to the Infrastructure

We inspected and photographed 11 electrical generating plants and 10 substations, using a standardized survey form to interview power-plant directors, engineers, technicians, and guards. For the nine facilities that we were unable to visit, we used information from the director general of Iraq's electric utility that we cross-checked with directors and engineers at other power plants.

In the first days of the war, 13 of Iraq's 20 power-generating plants were incapacitated or destroyed. At the end of the bombing only two plants remained operational, producing less than 4 percent of the prewar output. By early May 1991, Iraq had regained only 23 percent of prewar output. Many of the power plants were destroyed beyond repair and will have to be completely rebuilt. At the time of our visit, damaged facilities could only be repaired by cannibalizing parts from other plants.

Iraq's entire system of water purification and distribution relied on electricity. With the destruction of the power plants, the system came to a virtual standstill. Although some water-purification facilities have become operational since the end of the war, water engineers reported that much of Iraq still lacks clean drinking water. In some areas, notably Basra in the south and Kirkuk in the north, we observed people collecting water from broken pipes surrounded by pools of murky water or even directly from drainage ditches. Throughout the country, many hospitals and health centers did not have adequate running water for standard sanitary procedures such as cleaning, flushing toilets, or bathing patients. None of the health facilities we visited used piped water for drinking purposes, because it was not considered safe. Instead, they used bags of water provided by the International Committee of the Red Cross.

The sewage-treatment system in Iraq was also powered by electricity. We visited the two sewage-treatment facilities that serve Baghdad. Both plants ceased operation during the first weeks of the war because they lost electrical power. One plant was later destroyed by allied bombs and, as of early May, continued to discharge raw sewage into the Tigris River. The surviving plant resumed operations with the return of limited power; it can treat only 50 percent of Baghdad's sewage. As a result, the drinking water of southern Iraq downstream is contaminated. We found that sanitation was poor throughout the country. Despite the recent increase in electrical power, the sewage systems were frequently unable to function properly because of blockages. Raw sewage therefore leaked into drainage ditches, formed open pools in residential neighborhoods, and contaminated water supplies. In neighborhoods in both Basra and Baghdad, whole streets were blocked by pools of foul-smelling water. Garbage collection had also ceased because of the shortage of fuel, and garbage was piled high in vacant lots or on sidewalks.

Morbidity and Mortality among Children

Given Iraq's level of urbanization and dependence on modern infrastructure, it is not surprising that we found an alarming increase in the incidence of waterborne diseases, including cholera, typhoid, and severe gastroenteritis. The staff at every health facility we visited reported similar problems; the incidence of these

diseases has reached epidemic proportions, and neither hospitals nor health centers have the capability to treat them appropriately.

Visits to hospitals in Irbil, Kirkuk, and Sulaymaniyah and to the Saddam Central Teaching Hospital in Baghdad revealed rates of gastroenteritis among pediatric inpatients of 91, 78, 84, and 38 percent, respectively. Although we have no comparative data from previous years for the regional hospitals, physicians told us that they had never before had to manage such an influx of children with gastroenteritis. Although the prevalence of gastroenteritis was not as great in Saddam Central Teaching Hospital as in the regional hospitals, both the hospital administrator and pediatricians informed us that it was considerably higher than the normal level. As the principal pediatric referral hospital for the country, Saddam Hospital usually dealt with more uncommon diseases requiring specialized treatment. For this hospital we were able to confirm the increased incidence of gastroenteritis by comparing admissions in 1991 with those in 1990. During the week of April 29, 1991, to May 5, 1991, 35 percent of the admissions (137 of 392) were due to gastroenteritis. The average weekly level for April and May 1990 was 17 percent of the admissions (70 of 403).

Outpatient facilities were also inundated with children with gastroenteritis. In Kirkuk Pediatric Hospital, outpatient consultations for gastroenteritis rose from an average of 4 per day in April 1990 to an average of 42 per day in April 1991. The proportion of outpatients with gastroenteritis had increased from 18 percent to 55 percent, and the hospital was drastically overloaded. At Baghdad's Saddam City Community Health Center, the proportion of cases of gastroenteritis increased from 3.6 percent in March and April 1990 to 17.7 percent in March and April 1991. This suggests that there is an epidemic of gastroenteritis in Iraq, a finding supported by data from a sentinel surveillance system monitored by the United Nations Children's Fund (UNICEF).[6]

Typhoid fever, diagnosed on clinical grounds, was occurring in epidemic proportions in Baghdad, Basra, Irbil, Karbala, Kirkuk, and Sulaymaniyah. Few of the facilities were able to confirm the diagnosis of typhoid, however, because of a lack of appropriate diagnostic reagents. The problem was particularly severe in the north, among the displaced Kurds. In Sulaymaniyah we documented a marked rise in the incidence of clinically diagnosed typhoid. In Irbil Pediatric Hospital, 63 of the 65 patients in the recently opened infectious diseases ward and 7 of the 75 patients in the general pediatric wards were being treated for typhoid. In Basra, health center staff reported that they were overwhelmed with children with clinically diagnosed typhoid. We were unable to confirm this, however, because the records were inadequate; physicians were unable to keep up with both clinical work and accurate record keeping. In Basra General Hospital we encountered a family in which three of four children shared a bed, and all of them were thought to have typhoid fever. They had collected their drinking water from a stagnant pool, since there was no piped water in their neighborhood.

Cholera, like typhoid, is endemic to Iraq, but at the time of our visit it was occurring at epidemic levels. At Al Qadisia Hospital in Baghdad, the senior pediatric resident reported 30 to 35 cases per week in April 1991, as compared with 2 or 3 cases in April 1990. This hospital had had such an increase in the number of cases

that a new infectious diseases ward was recently opened for children with suspected cholera. Physicians and administrators throughout the country reported a marked increase in the number of suspected or confirmed cases of cholera. Again, tests to confirm the diagnosis were not always available.

There were also high levels of severe malnutrition, in the form of marasmus or kwashiorkor, among pediatric inpatients. Cross-sectional data from Saddam Central Teaching Hospital and Irbil, Kirkuk, and Sulaymaniyah hospitals revealed rates of severe malnutrition among hospitalized children under five years of age of 32, 57, 52, and 48 percent, respectively. Almost all these children were less than 3 years old, and the overwhelming majority were under 12 months. Many of the young physicians we spoke with had never seen a case of marasmus before the Gulf crisis, and even the older physicians had not seen so many.

This high prevalence of severe malnutrition in hospitals may be attributable to epidemic levels of gastroenteritis, typhoid, and cholera. It was our impression, however, that the malnutrition was also associated with the shortage and high cost of food, particularly infant formula. UNICEF reported a reduction since December 1990 in breast-feeding in children less than three months of age,[6] probably as a result of malnutrition in the mothers. This decline in breast-feeding, combined with the shortage of appropriate formula, has apparently contributed to the problem.

The mothers of these children repeatedly told us of the scarcity and prohibitive price of infant formula. T market price for a 450-g can of formula was 8 to 12 dinars ($24 to $36). Government rations of formula w insufficient for basic requirements, and mothers whose breast milk was inadequate often resorted to solutions of sugar and water or sometimes the water left after cooking the family's rice.

In Basra General Hospital, Al Qadisia Hospital, and Saddam Central Teaching Hospital, we were able to gather comparative data on admissions and deaths in 1990 and 1991. The data all demonstrated the same pattern: a reduction in admissions, an increase in the total number of deaths, and a two- to threefold rise in the hospital mortality rate. The decline in admissions was thought to be due to extreme transportation difficulties caused by lack of fuel. This was most marked in the period from January to March, and it was beginning to change by April, when transportation improved. The increase in deaths during the first four months of 1991 was probably due in part to children presenting to the hospital with a more advanced stage of disease, a phenomenon that was reported to us by many physicians. It was also probably due in part to the reduced ability of hospitals to provide good care. Iraqi physicians reported that death rates among children in the community were as high or higher than those seen in hospitals.

Health Care Services

Many hospitals and health centers were severely damaged during the bombing and ensuing civil uprisings. Dr. Said Shakir Mahmoud, director of the Ministry of Health's planning section, reported that a total of 20 hospitals and 38 health centers were physically damaged and looted during the course of the Gulf crisis.

The hospital at Az Zubayr was said to have been destroyed during Operation Desert Storm. Four of the five health centers in this city of 150,000 were damaged in the civilian uprisings, leaving only a single health center to meet the needs of the people. Basra Teaching Hospital was evacuated on January 26, according to its director, Dr. W. Al-Rawi, after bombing left a crater in the hospital garden, almost every window in the hospital shattered, the ceilings collapsed, and the intensive care ward in ruins, with three patients dead. During our visit the windows were still largely boarded up, and repair work had commenced. The intensive care unit and pediatric ward remained closed.

In Kirkuk we interviewed the director of the hospital in his conference room, the walls of which had been riddled with bullets from the Kurdish uprising and in one of which there was a huge hole. Only one quarter of the wards were open. In Karbala the hospital had been devastated during the civilian uprisings and at the time of our visit was operating at about one fifth of normal capacity, with the elimination of all major services, including the intensive care unit, the coronary care unit, and the operating room.

At the time of our visit, many health centers were still closed. In the city of Basra, 14 of the 19 health centers were closed, according to Dr. R. Alani, provincial director of health. In the province of Irbil only 5 of 42 health centers were functioning, according to Dr. A.B. Hanna, assistant director of health, and in the province of Sulayaniyah only 6 of 20 health centers were operating (Rashid JA: personal communication).

Even facilities that were open were rarely operating at their prewar capacity. At Saddam Central Teaching Hospital only two thirds of the medical wards and half the surgical wards were open, and the outpatient clinics were closed. Of the four health centers we visited in the Basra district, only three had been offering vaccinations in the previous two weeks, but they were not available every day because of the lack of refrigeration.

Most of the health facilities had persistent problems with electricity, sanitation, and water. Of the 16 functioning hospitals and health centers we visited, 8 reported either a complete lack of running water or inadequate water supplies. Several relied on irregular supplies of water trucked in and stored in tanks, or on broken pipes nearby. Eleven of the 16 reported major problems with sanitation due to lack of water or damage to sewage facilities, often resulting in the complete lack of toilets or washing facilities for staff and patients.

Five of the facilities we visited still had intermittent electrical failures and consequent difficulties with refrigeration, sterilization, and other equipment. However, this was a great improvement over the situation during the allied bombing and the period immediately thereafter, when most hospitals had to rely completely on generators. These generators were frequently overloaded and had to be shut down for hours at a time. They were rarely of sufficient power to supply a whole hospital. At Saddam Maternity Hospital in Baghdad the director, Dr. W.A. Mahmoud, told us of the difficulties of performing cesarean sections by lamplight.

All hospitals and health centers reported substantial problems with laboratory and radiology services. In some cases they were at 15 to 20 percent of normal operational levels, primarily because of a lack of reagents and disposable equipment, as well as damage or looting of major diagnostic equipment in some regions.

Staff shortages that began during the embargo were greatly exacerbated by the bombing and civil uprisings. Irbil Pediatric Hospital was operating with 33 percent of the normal number of doctors and 40 to 50 percent of the nurses, according to the director, Dr. J.I. Jaafar. The Saddam Central Teaching Hospital reported that it had less than half its normal nursing staff.

All the health facilities we visited reported major shortages of drugs. These shortages, which allegedly began in the second half of 1990, included antibiotics, antiparasitic agents, local anesthetics, vaccines, intravenous fluids, and medications such as insulin and digoxin.

Conclusion

The intrinsically chaotic nature of international and civil wars usually makes it difficult to assess their effects on the health of civilian populations accurately, although there have been some exceptions to this rule.[7 8 10] Here, we have attempted a rapid assessment of the status of children's health and health services in postwar Iraq.

We found suffering of tragic proportions. As is so often the case, the youngest and most vulnerable are paying the price for the actions of others. Children are dying of preventable diseases and starvation as a direct result of the Gulf crisis. The current conditions in Iraq reflect the cumulative effect of the military actions taken by Iraq, United Nations sanctions, allied bombing, civilian uprisings, and the subsequent suppression of these uprisings by the Iraqi government. Although it is difficult to measure the effect of each of these elements, the predominant factor contributing to epidemic waterborne diseases was clearly the destruction of the electrical infrastructure.

Although the allied bombing may have caused relatively little direct damage to the civilian population, the destruction of the infrastructure has resulted in devastating long-term consequences for health. We normally consider civilian casualties to be only those that are a direct result of injury during war, but this definition deserves revision. With the changes in military technology and the strategy of warfare, including the capacity to target precisely and destroy a country's infrastructure, there may be many more indirect than direct injuries and deaths.

The economic sanctions on Iraq are also taking their toll. Although the sanctions were intended to permit the importation of goods essential for civilian survival, these goods (food, medicine, and parts to repair the infrastructure) are not reaching those in need. Whether the bottleneck is legal, logistical, political, or economic, it is effectively inhibiting access to required goods.

If action is not taken to alleviate the growing health catastrophe, the situation in Iraq will inexorably worsen. Despite their attempts to meet the needs of the Iraqi people, the efforts of international humanitarian agencies are not sufficient. The resolution of this crisis is critically dependent on both the international community and the Iraqi government.

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