

Health services in Iraq

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After decades of war, sanctions, and occupation, Iraq's health services are struggling to regain lost momentum. Many skilled health workers have moved to other countries, and young graduates continue to leave. In spite of much rebuilding, health infrastructure is not fully restored. National development plans call for a realignment of the health system with primary health care as the basis. Yet the health-care system continues to be centralised and focused on hospitals. These development plans also call for the introduction of private health care as a major force in the health sector, but much needs to be done before policies to support this change are in place. New initiatives include an active programme to match access to health services with the location and needs of the population.

Introduction

In this Review, we aim to provide an appreciation of the health status of Iraqis, the function of Iraq's health system, the rapid changes occurring in the health sector, and the need for improved policies to guide these processes.

During the 1970s and 1980s, Iraqi health care and medical education were said to be the best in the region.¹ The country boasted free health care in 172 hospitals and 1200 primary health-care clinics.¹ Iraqi medical graduates would often receive specialty training and certification in the UK and Germany. From the late 1980s until 2004, most medical graduates were barred from leaving Iraq.

After Saddam Hussein came to power, funds were diverted from the health sector. The 1980–88 Iran–Iraq War killed perhaps half a million people on both sides, and further diverted resources and medical staff from civilian facilities.² In 1991, Iraq invaded Kuwait, triggering the first Gulf War. The sanctions that followed had a major effect on Iraq's health system and the health status of Iraqis.^{3,4} The subsequent oil-for-food programme mitigated some of the effect of sanctions, but serious damage had been done to the health system. At the time of the 2003 US-led invasion of Iraq, the health system was weak, with non-functioning equipment, inadequate drug supplies, and fragile infrastructure.⁵

The destruction and looting of health facilities that followed the invasion resulted in heavy loss of equipment and pharmaceutical stocks.⁶ Quality of care continued to deteriorate and shortages were widespread.⁷ Major loss of health staff from tertiary hospitals had an effect on teaching of trainees and care of patients.⁸ In 2012, the UN High Commissioner for Refugees estimated that 3·1 million people in Iraq were in need of assistance;⁹ about 1·4 million people are internally displaced.¹⁰ Both refugees and internally displaced individuals have unsatisfactory access to health services.^{11–13}

During the 2003–11 occupation of Iraq by coalition forces \$53 billion in assistance schemes were implemented with varying success.¹⁴ The Federal Ministry of Health went through difficult times, under the control of various sectarian groups. In the north, the Kurdish Regional Government in Erbil developed its own budget and management process, which was similar to that in Baghdad. Staffing of health facilities in the Kurdish area

was augmented by immigration of doctors and nurses fleeing from elsewhere in Iraq.¹⁵

In May, 2006, Nouri al-Maliki became the Prime Minister of Iraq. British troops left Iraq in 2009;¹⁶ the last US forces were withdrawn in 2011. Although violence and political instability continue, normal life is returning to much of Iraq. However, the country faces staggering health challenges, especially to the function of its health system.^{16–18}

Health status of Iraqis

Over the past four decades a rapid demographic and epidemiological transition has occurred in Iraq (figure 1,¹⁹ panel^{20–23}). The accompanying Review by Barry Levy and Victor Sidel²⁴ includes a further summary of key health and demographic indicators. The population of Iraq is estimated to be 32·2 million with annual growth of 2·3%, down from 3·1% in 1990.²⁵ This increase compares with 0·6% in Syria, 1·1% in Iran, and 1·7% in Egypt.²¹

Key messages

- Iraq's health system is still struggling to recover from years of war, sanctions, loss of health workers, looting, and political interference.
- Health facilities and the health workforce are inequitably distributed to meet the country's health needs. Although the Ministry of Health is addressing this need, creation of equitable access to health care throughout Iraq is an arduous and complex undertaking.
- Ostensibly, the family health-care approach forms the basis of Iraq's health system, yet the major investments continue to flow into secondary and tertiary health facilities.
- Health strategy remains weak and uncoordinated, still heavily focused on clinical services, while major public health problems such as smoking, obesity, and non-communicable diseases are not being fully addressed.
- Health-care financing and the role of private health care are looming issues for the health sector, which are now only tentatively being addressed.

Search strategy and selection criteria

We searched PubMed and commercial search engines with the terms "Iraq health" and "Iraq" for work published between 1980 and the present. Documents in English and Arabic were reviewed. We used sources and databases from major media sources, non-government organisations, ReliefWeb, UNICEF, World Bank, and WHO. Additionally, we secured reports, official documents, evaluations, and assessments from the Iraqi Ministry of Health. Extensive discussions were carried out with Iraqi doctors working in hospitals, clinics, the Ministry of Health and directorates of health, and academic centres.

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See [Editorial](#) page 875

See [Comment](#) page 877

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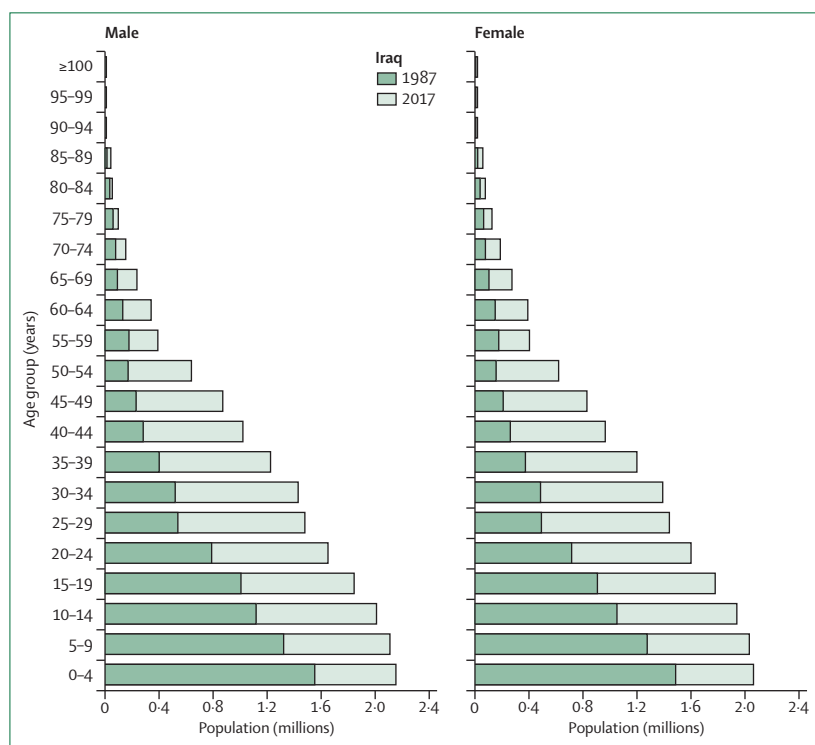


Figure 1: Age distribution in Iraq, in 1987 and 2017

Data from US Census Bureau.³⁹ On the basis of this population structure, maternal and child health and non-communicable diseases are both priorities. Both can be addressed through a family health-care approach.

Panel: Demographic status and health indicators in Iraq

Currently in Iraq

- Total population: 32 227 000²⁰
- Life expectancy: 68.9 years for men, 71.7 years for women²⁰
- Under 5 mortality rate: 39 per 1000 livebirths²²
- Infant mortality rate: 31 per 1000 livebirths²²
- Maternal mortality ratio 63 (WHO) and 25 (Ministry of Health)²¹
- Non-communicable diseases: diabetes 10%, hypertension 44%, overweight or obese adults 67%²⁰
- Illiteracy: 11% of men, 24% of women²³
- Physicians: 7.8 per 10 000 population²⁰
- Nurses: 14.9 per 10 000 population²⁰

The goal of the Ministry of Health by 2014 is to achieve

- One physician per 1000 population
- One dentist per 5000 population
- One pharmacist per 500 population
- Four nurses for each physician position
- Five paramedical staff for each physician position

From 1990 to 2010, the total fertility rate decreased from 6.1 to 4.7, but remained higher than in the surrounding region. The Iraq estimate for 2013 is 3.50.²⁶ The population is largely concentrated in urban regions and agricultural areas (figure 2⁷).

Gross national income per person was estimated at US\$2640 for 2011.²⁸ About 22.9–29.7% of Iraqis live in poverty.²⁹ Government spending on the social sector has increased substantially in the past 2 years³⁰—sustaining this level of support depends to some extent on oil revenues. During the years of sanctions and wars, school enrolment and literacy declined.³¹ High unemployment is a major problem, especially among young adults.³² Access to safe water and sanitation is low.^{33,34} The 2013 Human Development Index for Iraq is 0.573, below that of its neighbours, and below the averages for Arab states and other middle-development countries.³⁵

Communicable disease outbreaks continue. Some, particularly outbreaks of cholera and dysentery, are related to the severe environmental and infrastructure damage during the first Gulf War, with additional damage after the 2003 invasion.³⁶ During 2012, northern Iraq had a major cholera outbreak,³⁷ which followed a previous outbreak that affected many areas of southern Iraq, including Baghdad.³⁸ An outbreak of hepatitis E was reported in Baghdad in 2011.³⁹ Tuberculosis continues to be a problem, although notifications decreased between 2002 and 2007.³⁸ The 2009–10 estimates of tuberculosis prevalence vary between 74/100 000 (World Bank⁴⁰) and 56/100 000 (WHO⁴¹), and cases are likely to have decreased substantially since then with improved treatment programmes. However, 203 multidrug resistant cases were detected in 2011, up from 115 in 2009. Other common communicable diseases include tuberculosis, schistosomiasis, measles, and varicella. In 2011, only 615 HIV cases were reported.⁴² However, new cases might increase now that movement across Iraq's borders is increasing. Malaria has been controlled in Iraq through treatment and environmental measures, but leishmaniasis continues to be a problem in some areas.⁴³

Non-communicable diseases now pose the largest disease threat to Iraq's population. Results of the 2006 WHO STEPwise approach to chronic disease risk-factor survey of 4800 households showed that 42% of men smoke and that 67% of adults have a body-mass index greater than 25.⁴⁴ Blood pressures measured at the time of interview showed that 40.4% of those surveyed had both systolic and diastolic hypertension. Testing for fasting glucose showed that 10.4% of participants had hyperglycaemia, although only 6.5% said that they had been diagnosed with diabetes. Half of participants reported a low level of regular physical activity, defined as activities that do not increase heart or breathing rates for 10 min or more. In 2006, observers noted that an increase in the case-fatality rate for myocardial infarctions was occurring, which was blamed on conflict interfering with the capacities of intensive-care units to provide care.³¹ Cancers are an emerging concern, with rates for childhood cancers substantially higher than those in high-income countries.⁴³ A doubling of childhood leukaemia has been reported from Basrah over a

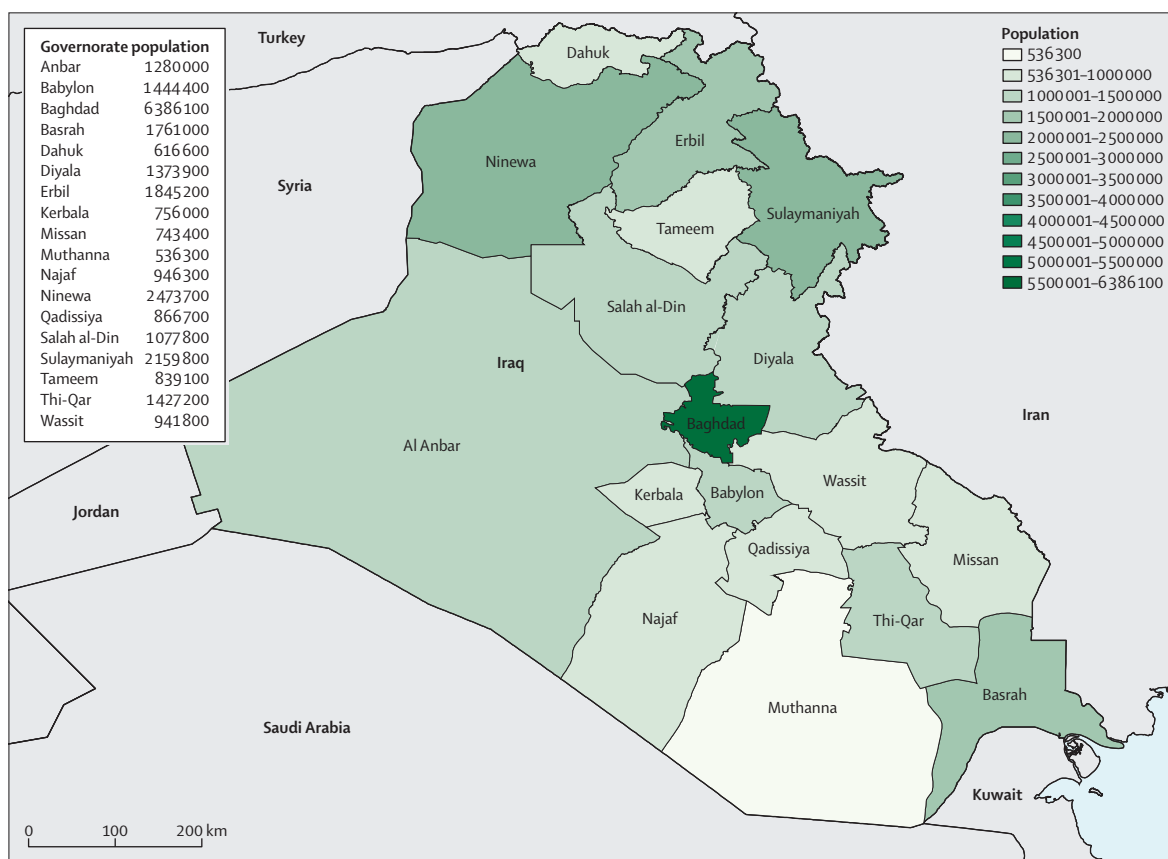


Figure 2: Population distribution in Iraq

Adapted from UN Office for the Coordination of Human Affairs, 2007.²⁷ Tameem Governorate also known as Kirkuk Governorate.

15 year period.⁴⁵ Future numbers of cancers will rise with an ageing and heavily smoking population.

Many reports have covered the estimates of violence in Iraq during the years of intense conflict; however, disabilities and mental health trauma from these years have not been widely documented. Perhaps 150 000 people are physically disabled by landmines, conflict, unexploded ordinance, and other remnants of decades of war, with few resources devoted to their rehabilitation.⁴⁶ The extent of psychological trauma in the population has led the Ministry of Health to include mental health in the basic health services package.⁴⁷ Although some pilot community psychosocial services have been implemented, how these services will be linked to the basic health services package if shown to be successful is unclear.⁴⁸ Paul Bolton⁴⁹ considers initial results of community interventions in an accompanying Comment.

Maternal and child health is an important health issue in Iraq. Declines in infant and child mortality rates have been slowed by the years of conflict and the effect of sanctions. 15% of newborn babies are estimated to have low birthweight, and neonatal deaths account for more than half the deaths of children younger than 5 years.^{22,50} Despite a public distribution system that

targets poor populations with supplementary food rations,⁵¹ 6% of children younger than 5 years were mildly or moderately underweight in 2006, and 26% were stunted.²⁰ Exclusive breastfeeding among children younger than 6 months of age was 31%.²² Nationally, 65% of children receive the third dose of diphtheria-pertussis-tetanus vaccine, completing the series.⁵² Immunisation for *Haemophilus influenzae* type b and rotavirus (an important cause of childhood diarrhoea in Iraq) were made part of the national immunisation schedule in January, 2012. Many birth defects have been noted from hospitals in Fallujah for which data are being analysed by the Ministry of Health.⁵²

Iraq is unlikely to meet Millennium Development Goal (MDG) 4 (two-thirds reduction in under-5 mortality rate) but might meet MDG 5 (three-quarters reduction in maternal mortality ratio).⁵⁰ Iraq's maternal mortality ratio is much debated because the WHO estimate is 64 per 100 000, but the Ministry of Health estimate is 25. More than 80% of pregnant women are delivered by a skilled birth attendant, and 65% are institutional deliveries.²² At least one antenatal clinic visit was reported by 84% of women delivering in 2006.⁵³ 17% of births are reported to be caesarean sections; popular reports

suggest that the emerging private hospital sector might be a driving factor.⁵⁴

Ministry of Health

The Ministry of Health was established in 1956. In the 1970s, it largely assumed its present configuration of a centralised model⁵⁵ focused on hospitals and curative care, providing free universal coverage, but with most resources concentrated in Baghdad. Further changes to this model were made in 1981, 1983, and 2003. In the past 10 years, frequent changes of senior personnel in the Ministry of Health, political entanglements, and scarcity of investment have left the ministry striving to meet accrued needs and new realities, despite extensive channelling of resources to health services. Major changes are now required to the 1980s governance framework.

The federal Ministry of Health is currently headed by Dr Majeed Hamad Amin. He is assisted by three deputy ministers and a ministerial council, and oversees about 60 departments. Each of the 18 governorates or provinces has a Directorate of Health (two for Baghdad), and beneath them, several health districts. However, the input into national health policy development from Directorate of Health level is weak and indirect. In 1992, a separate Ministry of Health was established for the Kurdish Regional Government, with much the same structure.

Expenditure on health is estimated at \$247 per person, a rise from about \$198 in 2007.⁵⁶ However, links between the Ministry of Health's health economics unit and national health priorities are not strong.⁵⁷ In the past, frequent Ministry of Health leadership turnover, coupled with the absence of a clear health strategy, weak internal controls, and insecurity has caused many well-intended programmes to fall short of goals, especially those dependent on external assistance. In the Kurdish Regional Government area there were similar descriptions of weak health-systems governance and fragmented services, which are being addressed in a reform process.⁵⁷

Although Iraq's health policy incorporated primary health care in 1983, hospital-based care remained the dominant policy and primary health-care clinics (PHCCs) were neglected.³⁰ Ministry of Health policy has now shifted to a family health services model with PHCCs as the foundation. Other policies, such as those for mental health, tuberculosis, HIV, and maternal and child health were created in the past, but have never been formally approved or implemented.³⁰ Systems for licensure of health professionals and accreditation of health facilities are not in place. The Ministry of Health is formulating a strategic plan, although it will probably follow the health planning part of the 2010 National Development Plan, which sets out a shift toward a market-driven economy.⁵⁵ The National Development Plan calls for all sectors to participate in reduction of poverty from its present high level, promotion of development in largely neglected rural areas, and strengthening of local government

through the decentralisation of many functions to the governorates and their component health districts. User participation is emphasised in the health strategy, though how this involvement will work is yet to be explained.

The National Development Plan also envisions a social insurance structure providing universal health coverage. This approach is in line with the focus on the private sector, privatisation of some government functions, and creation of private investment opportunities. At present the public sector employs all doctors in Iraq. Doctors work for a variable proportion of their time in the public sector but supplement their income through work in private clinics or hospitals. This dual employment arrangement is not viewed as sustainable in the long term.³⁰ Creation of separate public and private sector employment options for health professionals is a major policy challenge.

Health service delivery

Iraq has 229 hospitals, including 61 teaching hospitals. 92 private hospitals exist, mainly located in the major population centres. Primary health care is provided by 2504 PHCCs, half of which do not have a medical doctor. Much of the population receives its health care through an estimated 10 000–12 000 private clinics staffed by off-duty doctors from the public sector.³⁰ Richer households are more likely to use private clinics than the public sector PHCCs, which are preferred by poorer households. However, even when services provided by public sector facilities are suboptimum, they remain an important source of care, particularly for people who are poor or unemployed.⁵⁸

Primary care

The foundation of the primary health-care system is the so-called health house, the base from which health workers address maternal and child health and environmental health issues in communities. Above this level is the subcentre, and then various types of PHCC. 375 PHCCs, mainly in areas without access to hospitals, are equipped with delivery rooms and an emergency room. Some PHCCs are designated as training centres, and 140 are fully updated and fully equipped facilities with staff who have received additional training through the USAID-funded Primary Health-Care Project.⁵⁹

Many of the PHCCs are in poor repair, inadequately staffed, and inequitably located. New PHCCs are being constructed and about 10% of primary health-care subcentres are being upgraded to PHCCs in an effort to better distribute services according to population needs. The shortage of human resources limits the number of facilities that can be upgraded. Staffing underserved areas with qualified doctors might require incentives to make this a desirable career option. The newly developed family health-care model links community facilities, managed by family medicine specialists, with the first referral hospital; the next step is to restore the referral

system onward to tertiary hospitals. Improved training of paramedical staff, improvements in community participation, and upgrading of facilities and equipment is needed before the goal of providing a comprehensive family health-care package for all Iraqis can be realised. A recently completed project focused on building mental health diagnosis and treatment skills among medical doctors working in 143 PHCCs through a 2 week course.⁴⁷ A more extensive programme has been developed to train community mental health workers in all 18 of Iraq's governorates.⁶⁰ These programmes are linked to PHCCs but are supervised by Ministry of Health personnel, which has sometimes been problematic.⁴²

Missan, one of the poorest governorates, launched an ambitious project using health visitors to link households and health facilities.^{61,62} Registration of patients and health records are computerised, with households holding these data on so-called smart cards. Prompts for required immunisations and clinic visits are sent by mobile telephone text messages. An assessment⁶³ showed complete child immunisation coverage to be greater than 90% in the catchment areas of six randomly selected health facilities. The Ministry of Health is considering this scheme as a potential model for expansion of family health care nationally.

Hospitals

As of 2012, Iraq has 13 hospital beds per 1000 population, compared with 18 in Jordan and 17·3 in Egypt.²⁰ More than half of hospitals were constructed in the 1970s and 1980s. The Ministry of Health has embarked on a major programme to build new facilities and to re-equip existing facilities. Construction of 400-bed hospitals is scheduled for Kirkuk and Muthanna governorates, and is underway in the Al Rashidiya area of north Baghdad.^{64,65} Iran has agreed to help construct hospitals in Karbala and Najaf.⁶⁶ Work has started on the upgrading of operating theatres in hospitals throughout Iraq.⁶⁷ An increasing proportion of the Iraqi health budget is allocated to projects in Baghdad, rising from 11·5% in 2009, to 19% in 2010.³⁰ Several new facilities are specialty hospitals for eye disease, cancer, and cardiac disease. However, many health workers are concerned that health technology is not efficiently used in Iraq, nor provision for its maintenance assured. With the expansion of health facilities, fears exist that technology such as MRI, CT, and haemodialysis equipment will be unequally concentrated in Baghdad. Putting hospitals in the right place and managing them well remains an unrealised goal.³⁶ Only about 40% of Iraq's population has access to referral services to hospitals from PHCCs.³⁰

Short working hours by doctors, dividing their time between their public and private work,³⁰ and the scarce equipment and supplies in many hospitals mean waiting times for procedures are long, despite an average bed occupancy of about 50% and an average length of stay

of 2·5 days. A recently introduced scheme in the Kurdish Regional Government uses financial incentives to hospital staff, particularly in operating theatres, to reduce waiting times.³⁰

Private hospitals tend to be small, with an average of only 25 beds. Most admissions to these hospitals are for surgery and deliveries and few provide general hospital care. A private hospital delivery could cost \$300 and a caesarean-section \$600, well beyond the reach of many Iraqis.⁵⁴ Iraq has no health insurance programmes, which means all private health care is met out-of-pocket. No ministry guidelines or regulations exist for private hospitals. Currently both private hospitals and clinics are largely outside the national health information and supervision systems.³⁶

Within the Ministry of Health a quality management unit has been created, but a culture of quality has yet to permeate health planning and management approaches. National performance standards have not been set, nor the capacity built at governorate and health district level to implement such standards. National accreditation standards were created for both hospitals and PHCCs in 2010. Pilot testing has been done at Al Kindy hospital, and with lessons learned, this scheme could now be rolled out to other hospitals, but a mechanism to do so has not yet been developed. The anticipated rapid development of a private medical sector will put the public sector facilities at a great competitive disadvantage unless issues of quality improvement in services at all levels is taken seriously.

Many of the health issues that face Iraq are public health concerns and will not be solved by increasing the sophistication of clinical services. Building of public awareness and momentum for behaviour change in areas such as smoking, exercise, and diet must be national priorities. Iraq needs a strong public health capacity to develop policy initiatives for environmental and occupational safety, injury prevention, mental health and disability programmes, and improvement of access to services for vulnerable populations.

Access to essential medicines

Until 2004, Kimadia, the state drug and medical appliances supplier, was the main importer and distributor of drugs and medical equipment for all Iraq. It now supplies only the public sector. In 2011, Kimadia's budget was \$1·25 billion;³⁰ 17% of procurement goes to the Kurdish Regional Government and 83% to the rest of Iraq.³⁰ Shortages of drugs and supplies are a regular feature in health facilities. Problems with lengthy procurement processes, cumbersome funding mechanisms, and a high turnover of technical staff contribute to insufficient stocks and delays in delivery.³⁰ A national pharmacovigilance centre has been established in Baghdad, with many governorates reporting drug adverse reactions. A national medicines policy has been developed for Iraq,³⁰ but has yet to be adopted. Drugs are dispensed at a

subsidised cost. Drugs for chronic diseases are provided free to people with a chronic disease card.

A robust private retail pharmacy sector has emerged, with about 10 000 outlets. A well functioning regulatory framework to manage commercial pharmaceutical importation has yet to be developed. Before 2003, several pharmaceutical manufacturing organisations were present. In the past 4–5 years, production has revived, with some 20 plants now in operation.³⁶ However, they remain largely unregulated.

Health information systems

In Iraq, information flows from facilities and the District Health Office to the governorate Directorate of Health and then to the central Ministry of Health, largely using paper forms. Although some computerisation has occurred at the Central Health and Vital Statistics Department, this development has not led to improved capacity for analysis, dissemination, or use of information.³⁰ To respond to disease outbreaks in a timely manner, governorates and health districts need the capacity and authority to make operational changes in services on the basis of data collected, but the centralised structure of the present health system prevents this approach. Building of the analytical capacity to pose and answer epidemiological and demographic questions about the health and the adequacy of services in Iraq is an important and easily reached goal. The human resources to do this exist in Iraq, but are not effectively exploited. Universities are only occasionally used to do special surveys, to support population-based studies, and to undertake detailed epidemiological analysis. To strengthen this capacity, the US Centers for Disease Control and Prevention has begun the development of an Iraq Field Epidemiology Training Program.⁶⁸

Efforts are required to strengthen the quality of data as it moves up the chain from facility to Ministry of Health. An unpublished study by the Ministry of Health and USAID's Primary Health-Care Project showed that 22% of maternal deaths were misclassified at the facility level. Further, as information moved from the hospital to the Directorate of Health there was a substantial deterioration in the quality of data in the copying and transmission process. A frequently discussed web-based information system would greatly improve data quality and timeliness. However, further efforts are needed to improve accuracy of disease classification and to

monitor completeness of data coverage at the facility level. Linkage between the information system and quality improvement teams at all levels in the health system is an opportunity to make substantial gains in outcomes for patients.

An early action in Afghanistan was to institute an annual National Health Services Assessment of primary health care services, and later hospital care, with a balanced scorecard approach. This strategy allowed government to track quality of care and assess the effect of policy and programme guidelines on service delivery.^{69,70}

Development of health systems research capacity

A consequence of Iraq's years of isolation and turmoil has been a loss of research capacity, although it seems to be recovering. During 2010, 22 publications were indexed in PubMed listing an author affiliation as University of Baghdad, rising to 63 in 2012. Many Iraqi universities publish their own medical and scientific journals (some only occasionally), and the Ministry of Health publishes the *New Iraqi Journal of Medicine*. Some journals have online links, but no Iraqi journals are indexed by the US National Library of Medicine.

At this pivotal point in Iraq's health system reconstruction, the evidence base for key decisions is missing. Universities can form a key partnership with the Ministry of Health in pursuing areas of importance. Identification of areas of poor quality within health services and proposal of methods to address these deficiencies could be a first step. Data are needed to better understand health disparities and health vulnerability. Academic medicine could contribute to the needed standards for the management of non-communicable diseases at the PHCCs and community level. There is much that Iraq can learn from and contribute to in the regional and international health literature.

Health workforce

Building and retaining an adequate workforce is one of the many challenges facing the health sector. Iraq lags behind regional averages for availability of health workers (table²¹). These numbers mask a serious maldistribution of professional staff. A disproportionately large number of Iraq's doctors and probably other health professionals, as well as hospital beds, are in Baghdad where 20% of the population live. Poorer governorates have lower numbers of doctors and other health workers than rich governorates. Before the 2003 invasion Iraq had an estimated 32 000 medical doctors, many of whom were teaching faculty at the country's 23 medical schools or in teaching hospitals.⁷¹ Many doctors left Iraq during the height of the conflict or were killed.^{15,72,73} This outflow has now lessened, although of the 1500–1800 new medical graduates each year, about a quarter leave, mainly to go to the UK, USA, and Australia. Efforts to encourage migrant Iraqi doctors to return have been largely unsuccessful. An efficient,

	Iraq	Jordan	Egypt	Syria*
Doctors	7.8	26.5	28.3	15.7
Nurses and midwives	14.9	43.7	34.9	19.1
Dentists	1.8	9.8	4.8	7.8
Pharmacists	2.0	12.6	16.3	8.2

*Data from 2010.

Table: Health workers per 10 000 population, data from 2011²¹

well-functioning health system could go a great way to stabilise this professional drain.

All medical and dental graduates are employed by the Ministry of Health on qualification. Nurses and graduates from the allied health sciences can now find immediate employment on graduation. Posting locations depend on various factors, including personal preferences, proximity to family, and potential for private medical practices. Doctors tend to be more mobile than nurses after graduation. These factors frequently contribute to lopsided doctor-to-nurse ratios. Insecurity has been an important driver for internal migration of health professionals, often to the Kurdish region, worsening the inequitable distribution of health workers.^{15,30}

Education

After years of isolation, Iraq has much to do to re-enter the international mainstream of clinical and health management practices. An urgent task is building faculty skills and updating the curricula for health-worker pre-service training within the Ministry of Higher Education. Linking of student intake with projections of health worker requirements and then allocation of sufficient financial resources for their training is perceived as a weak and ineffective process.³⁰

Currently there are 23 medical schools in Iraq, one in each governorate, two in Ninawa, and five in Baghdad. Medical schools have affiliated teaching hospitals. All schools follow the standard Iraqi curriculum based on the British model of medical education established during the period of British influence in Iraq, except Tikrit, which has introduced problem-based learning and a case-based approach using individual and small group study.⁷⁴ Iraq's medical school curriculum is widely thought to need revision and updating. Specialty training is at the master's and doctorate levels or can be certified by the Iraq Board of Medical Specializations or the regional Arab Board of Medical Specializations. To meet the needs for primary health care, a 4-year family medicine specialist training programme has been created at five medical schools, with graduates eligible for board certification. Additional diplomas and short courses in family medicine exist. By 2007, five postgraduate programmes had produced 127 certified family health specialists.⁷⁵ In 2012, about 40 additional family medicine graduates received certification after completing training. A similar number is likely to qualify in family medicine in each of the next several years.

Improvement in technical skills has been addressed through many workshops by various organisations, scholarships for longer courses, and attachments outside Iraq. The Ministry of Health and the BMJ Group set up online courses for in-service education, research, and professional development, which also provide access to key medical journals.⁷⁶ However, an organised and compulsory programme of continued professional education for practitioners is needed.

Links with professional bodies internationally could help Iraqi health practitioners to strengthen standards of care.

In the past, nurses and midwives were mostly trained at high-school level. In the Kurdish Regional Government area, some nurses received additional training in Iran. Before the 2003 invasion, the health system depended heavily on expatriate nurses for senior nursing positions with poorly educated Iraqi nurses providing the bulk of care.⁷⁷ A 2004 nursing strategy paper proposed a major shift to train nurses with college or university degrees⁷⁸ and most nurses (about 700–800 graduates a year) now receive a bachelor's degree from one of the 12 college or university programmes, although much health-care training is still done at high-schools. Many senior nurses left their hospitals during the height of the conflict and replacing this expertise and experience will be difficult. Iraq recently recommenced recruitment of foreign nurses for Baghdad's Medical City Hospital and in the Kurdish Regional Government.⁷⁹

Dental training is offered at 12 schools of the Ministry of Higher Education and two private schools. About 800 dentists graduate each year.³⁰ Pharmacists are trained in 12 public sector schools and four private schools that offer 4-year training programmes. BSc and MSc level programmes are available in some of the allied health sciences, although the training of this cadre is an area that requires extensive strengthening.

The focus on clinical and hospital-oriented health services has prevented the development of a strong public health workforce in Iraq, though their importance is recognised.¹⁸ Since the late 1980s, Iraq's community health faculties have produced many graduates. These programmes are limited to doctors, and lack the wider emphasis on health services management, health policy, health financing, and the social sciences, which now form a part of public health training elsewhere and which are of crucial importance to Iraq. People with these skills will be in great demand in future, especially in management, as the health system expands, decentralises, and links more of its programmes to an evidence base.⁸⁰ The recent WHO workshop in Baghdad,⁸¹ which called for stronger health system accountability and a rigorous evidence base for monitoring of health programmes shows the shortage of health professionals to do this work.

Financing of health services

Creation of the first national health account was started in 2010, and subsequently incorporated into the Iraq private sector modernisation report.³⁰ Earlier health financing data include the 2007 Iraq Household Socio-Economic Survey (IHSES) and WHO expenditure estimates.^{82,83}

In 2010, Iraq spent about 8.4% of its estimated gross domestic product (GDP) of \$82.2 billion on health.^{83,84} External resources spent on health amounted to only 0.8% of GDP.⁸³ The actual amount was estimated to be

\$247 (purchasing power parity \$340) per person, a substantial increase from \$118 in 2008. For 2010, 18.8% of health expenditure was estimated to be out-of-pocket. In the 2007 IHSES survey, 18% of the out-of-pocket expenditure went to Ministry of Health hospitals, 34% to doctors' private clinics, 39% to pharmaceuticals, and 9% to transportation.⁸² Figures from the national health account show that whereas the bulk of government funding goes to provide clinical services the costs for pharmaceuticals takes 36.8% of the national health-care budget and administrative costs 2.3%.³⁰ The growing private pharmacy sector now accounts for 28% of expenditure on drugs.³⁰

Hospitals do not have the flexibility to manage their services effectively, because budgets and procurement procedures are handled centrally. The poor connections between the finance and planning directorates of the Ministry of Health create many of these difficulties.

The role of the private sector will grow substantially in future, although this increase must be matched by increased regulatory capacity by the Ministry of Health, which will have profound budgetary implications. If Iraq follows its course of family health care as the foundation of the health system, this process could include roles for both public sector services and private clinics or health-care organisations. Both contracting-in and contracting-out with private groups are potential options. Private primary care services would probably be most popular in affluent urban areas, depending on the structure of the social insurance scheme developed. Hospital services, especially at the tertiary level, will remain largely a public sector function. As costs of operating large hospitals rise, their locations in key urban areas, with efficient referral networks, will be important to achieve maximum efficiency. Private specialty hospitals, with private laboratories and diagnostic facilities, are likely to develop in some urban areas. Maintenance of the quality of services in the private sector and monitoring of their work in the national health information system is important. Regulation of the emergent private pharmacy sector poses a challenge, as it lacks almost any national policy, and pharmacies in this sector dispense almost entirely proprietary drugs rather than much cheaper generic preparations.³⁰ Increasing the role of private care will create a major realignment of the health workforce. Serious attention to forecasting demands on institutions of higher education and for the remaining public sector has not yet been addressed.

Future directions

Although Iraq's population has been transitioning through major epidemiological and demographic changes, the Ministry of Health has not kept pace in developing appropriate policy. Governance remains heavily centralised, and is not transparent. Many of the country's most pressing needs are for public health

interventions, yet these are not fully addressed by a government still struggling to restore basic functions. Major policy changes are needed at almost every level of governance, but few data are available to support evidence-based decision making. By contrast, in Afghanistan, early work went into development of policy to guide primary health care and hospital services, and a national health policy was in place less than 3 years after collapse of the Taliban government.^{85,86}

Reconstruction of health facilities visibly strengthens government legitimacy, yet consumes resources for services that might not be of acceptable quality.⁸⁷ In the rush to modernise hospitals, Iraq must not waver in its commitment to primary health care and universal access for millions of vulnerable Iraqis. This primary level of care might prove most effective in addressing the physical and psychological trauma from decades of war and losses which threaten both individual recovery and society's return to full function.

Moving from the socialist era of centralised management to a decentralised participatory health system requires skills and capacities that Iraq does not yet have. Shaping a skilled health workforce to manage future needs requires far closer coordination among health managers, planners, and educators than now exists. Creation of a private sector role in health care must be done with care and deliberation with adequate regulation and oversight to deliver value for money to Iraq.

Conclusions

Decades of sanctions and war have seriously compromised a once proud and functional health system. It now struggles to rebuild itself, having adequate financial resources, but with a shortage of skills and strategies. Although the fragmented health policy seems to emphasise further development of a health system based on the family health-care model, resources are heavily directed toward expansion of secondary and tertiary health-care facilities. Human resource development fails to link needs, strategic plans, and training programmes together. As the public sector loses its monopoly on the employment of doctors, major changes loom in the health system, for which there are as yet no policies. Missing from the discussions of strategic planning is a solid evidence base on which to build policy. Additionally, the continuing sectarian insecurity in Iraq makes even the best plans difficult to implement.

Contributors

All authors contributed to the search and identification of reference materials. TKAH and RL drew extensively from their own experience in Iraq in shaping the paper. All authors contributed to the interpretation and themes of the paper. GB consolidated the references and oversaw the writing and submission for publication.

Conflicts of Interest

TKAH and RL are employed by the Iraqi Ministry of Higher Education. GB has served as a paid consultant to health projects organised by non-governmental organisations in Iraq.

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