Published in final edited form as:

Glob Public Health. 2010 November ; 5(6): 561–577. doi:10.1080/17441690903473246.

Health system reconstruction: Perspectives of Iraqi physicians

A. Squires^{a,*}, A. Sindi^b, and K. Fennie^c

^aCollege of Nursing, New York University, 726 Broadway, Rm. 1029, New York, NY 10003, USA

^bMinister of Planning, Kurdistan Regional Government, Iraq

^cYale University School of Nursing, New Haven, CT, USA

Abstract

In conflict or post-conflict situations, health system reconstruction becomes a critical component of ensuring stability. The purpose of this study was to determine the priorities for health system reconstruction among Iraqi physicians residing in the northern region of the country. A convenience sample of practicing male and female physicians residing in the Kurdish region completed a 13-item survey about health system reconstruction. A total of 1001 practitioners completed the survey with gender breakdown of 29% female and 71% male, all working in different specialty areas. Significant differences between the providers based on gender ($p = 0.001$), specialty ($p = 0.001$) and geographic location ($p = 0.004$) were found to affect the responses of the participants. This study demonstrates that input from healthcare professionals is important for health system reconstruction, but that gender, geography and medical specialty make the process complex.

Keywords

Iraq; physicians; human resources; conflict; war; health systems; global health

Introduction

Human resources are critical parts of a healthcare system and can help or hinder health system policy implementation (Dussault 2008). Frequently, however, a cadre of elites has sole responsibility for the administrative decision-making in health systems. International funding agencies, the global political economy of resource allocation and local or regional politics all influence the policy choices of these elites. Unfortunately, it is not uncommon for feedback from ground-level professionals and other workers to factor out of the decision-making equation.

In a post-conflict situation, health system reconstruction involves not only replacing or repairing physical infrastructure, but also building and restoring infrastructure capable of

© 2010 Taylor & Francis

*Corresponding author. aps6@nyu.edu.

Publisher's Disclaimer: Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

producing healthcare professionals of all types. Countries recovering from conflict situations or those with newly stable regions rapidly need to repair and scale up health services to help increase social and economic stability (WHO 2005). Unsurprisingly, highly charged politics emerge from the competing interests of different healthcare practitioner groups and can complicate the process.

Post-conflict situations also urgently require good, data-driven evidence to structure resource allocation efficiently, especially for organising short-term health services delivery and long-term planning. As a topic of study, post-conflict health system reconstruction receives little attention, with only four published articles that specifically address the issue at a system level (Ljubi 1998, Eliades *et al.* 2001, Squires *et al.* 2006, Soeung *et al.* 2007). The devastating effects that war, conflict, economic sanctions and assorted human rights abuses have on surviving healthcare professionals receive slightly more attention as a research topic and all studies indicate that the aforementioned issues will complicate reconstruction efforts (Hendel *et al.* 2000, Akunjee and Ali 2002, Hawrami and Ibrahim 2004, Ahmed 2007, Huggan 2007).

In light of these factors, the purpose of this study was to determine the health system reconstruction priorities of Iraqi physicians. Physicians from the northern Kurdish region served as the case example since, at the time of the study, this was the most stable region of the country. We adapted the physician study from a successful survey of 744 nurses in the same region (Squires *et al.* 2006). We aimed to discern not only the reconstruction priorities of physicians, but also to determine how other factors might affect these priorities.

Background

Estimated 2005 data from the World Health Organisation (WHO) indicated that Iraq's population hovered around 27 million people, with 6.6 physicians, 1.2 dentists, and 12.6 nursing/midwifery personnel per 10,000 population (EMRO 2007a, Gerber 2007). The ongoing war in the southern region of the country created wide variations in the overall status of the healthcare system and still persists today.

Northern Iraq, also known as Iraqi Kurdistan, borders Turkey, Iran and Syria. After the 1991 Gulf War, the 'no-fly zone' helped to generate stability in the region, even though sporadic violence still exists. Ethnic Kurds dominate the region demographically, while other Muslim groups and some Christian sects also reside there.

In terms of health professions infrastructure, there are three schools of medicine and nursing in the region (Amin and Koshnaw 2003, Garfield *et al.* 2003, Garfield and McCarthy 2005, Squires *et al.* 2006). In the current medical education system, Iraqi physicians study medicine for 6 years with specialised training ranging from 1 to 4 years of post-graduate study (EMRO 2007b). While many women study medicine, female physicians face unemployment, underemployment and employment discrimination in large numbers (Gerber 2007). These factors have kept the numbers of female physicians in practice at very low numbers.

Due to the political events of Iraq during the last 25 years, little research about Iraqi physicians has occurred. Of the publicly available research found in international databases, one study found patients preferred a female physician for obstetrical and gynecological care (Lafta 2006). Two studies evaluated physician knowledge about modern practices for breast feeding and tuberculosis management (Hashim *et al.* 2003, Al-Nassaj *et al.* 2004). Another study evaluated the effectiveness of a community oriented medical teaching model (Al-Dabbagh and Al-Taee 2005).

Only two studies addressed physician workforce issues. A 2004 survey evaluated how physicians had participated in human rights abuses under Hussein's regime. In that study, 71% of physicians reported their colleagues had participated in torture activities (Reis *et al.* 2004). A more recent survey of physician job satisfaction, in the same region, not only found that northern Iraqi physicians had high job satisfaction rates (75.8%), but also dealt with high stress levels (55.7%; Shaikh *et al.* 2006). None of the studies addressed ground-level Iraqi physician participation in or perspectives about health system reconstruction.

Methods

We found no instruments for collecting physician perspectives in post-conflict situations. Building from a validated instrument used to evaluate Iraqi nurses' priorities for health system reconstruction and professional development (Squires *et al.* 2006), we adapted that survey for physicians. We kept the theme of the questions the same, but altered the choices to fit the physician role.

Traditional survey instrument development and testing processes would have taken too long to provide information in this case. Our survey development process had to adapt to the timeliness and situation within Iraq. Nonetheless, we attempted to systematically approach the instrument validation process to increase the chances for reliable and valid results. We used simple face validity processes to confirm the applicability of the questions to the physician population through feedback obtained from five local physician experts. This survey was administered in English because medical education in Iraq requires English-language skills, at least at discourse competence levels. Questionnaire development and administration in English reduce the risk for conceptual errors that a translation process can introduce. At the same time, we kept the survey's English-language structure simple to maximise comprehension by the physicians and minimise the risks for misinterpretation of questions since English is not their first language.

The resulting 13-item Physician Health System Reconstruction Priorities (PHSRP) survey collects both quantitative and very basic qualitative data. Thematically, the questions centre on factors influencing role performance in the acute and primary care setting, medical education, physical reconstruction of healthcare facilities and disease or condition treatment targeting. The first six items collected basic demographic data about physicians, including place of work and specialty. These data help to provide a picture of where physician human resources concentrate demographically. In the next six items, physicians chose the five most important reconstruction and professional development issues to address out of 10 possible options. They did not rank each priority during the selection process. That way, priorities would emerge based on the frequency of responses. Finally, an open-ended section allows subjects to add other relevant information or comments and concludes the survey.

Ethical concerns about conducting the study centred on political risks to subjects and how these might affect response rates and quality of responses. The authors strongly emphasised subject de-identification during the data collection process and opted not to ask about ethnic identity to add additional layers of protection for the subjects. All collaborators completed an online human subjects training programme available through Yale University. The internal review board at Yale University School of Nursing completed the human subjects' review of the study.

Data collection

Data collection occurred during late 2005. For data collection, volunteer research assistants, trained by the local collaborator, recruited subjects for the study through convenience sampling in four areas of the northern region of Iraq: Kirkuk, Dohuk, Suleimaniyah and

Erbil (see Figure 1). The volunteers received training in how to instruct subjects to complete the forms. From their experiences with the nurses' study, the researchers found that having the volunteers wait while the subject completed the forms proved the most effective way to obtain an adequate number of surveys.

Once the subjects completed the surveys, data were entered into a database by the local collaborator who then emailed the database to the US researchers for analysis. To determine priority responses from the physicians participating in the study, we used simple response frequency assessment. Chi-square analysis was performed to determine if there was an association between the responses (priorities) and physician gender, specialty, place of work and geographic location. Bonferroni correction was used to determine a corrected alpha (0.0008) in order to adjust for multiple chi-square tests. Stratified analyses were done to control for the effect of specialty on the relationship between gender and priorities. Extended Cochran–Mantel–Haenszel methods were used to calculate a summary chi-square statistic.

Results

A total of 1001 physicians responded to the survey. With WHO estimates of the total number of physicians in Iraq at approximately 19,000, the sample represents about 10% of the total physician population. For the Kurdish region, the sample may represent 25% or more of the local physician population. We can only provide estimated numbers of physicians because officials in the region, at the time, did not have exact numbers for the total physician population. Many physicians from the southern region of the country had migrated north to work under safer conditions, thus affecting any estimates of the total physician population in the region. We present the results in four sections: respondent demographics; priority actions for health system reconstruction; an analysis of the effects of demographic characteristics on subject responses; and a basic content analysis of survey comments.

Respondent demographics

Table 1 provides the demographic breakdown of subject characteristics. Due to an error in the data collection process, age of respondents was not collected. Therefore, we estimated age based on years of experience indicated by the subjects. This places the average age of physicians in the region at around 30 years, with a range of 24–64 years, confirming findings that experienced physicians have largely left the region. Since the median years of experience of respondents was four years, the authors expect the majority of respondents were in their late twenties or early thirties due to medical education patterns in the region. The gender breakdown of subjects was 71% male and 29% female, an atypical sample based on previous studies that show female physicians as only 10% of the physician population. The majority of respondents resided in Erbil (40%).

Nearly three quarters of physicians participating in the study had a post-graduate degree while 12% were board certified or had attained a higher degree. Specialists (29%) and House Officers (26%) comprised the majority of respondents and thus, unsurprisingly, 68% of respondents indicated that they worked in hospitals.

Physicians participating in the study indicated a wide variety of specialties. To facilitate data analysis, the authors grouped the respondents into one of five categories: medicine (39.3%); surgery (26.4%); OB/GYN (10.8%); pediatrics (9.8%); and other (10%). Due to small numbers of respondents, the 'other' category included administrators, dentists and a variety of health services support areas where Iraqi physicians are employed (laboratory, pharmacy, etc.).

There were significant differences between men and women in the types of specialties they worked in ($p < 0.0001$). The only specialty where female physicians dominated was OB/GYN (79.4%). One third of pediatricians (34%) and physicians classified as 'other' (31.6%) were female. In medicine, females comprised a quarter of respondents (25.8%) and surgery had the lowest percentage of females (11.5%).

Priorities for health system reconstruction

Table 2 highlights physicians' priorities for health system reconstruction. Responses are listed based on frequencies, indicating that item as a priority for reconstruction. With only two exceptions, at least 50% of surveyed physicians had to pick an item to demonstrate that the item was an important priority for health system reconstruction. The exceptions included medications for patients (49%) and vaccine supplies (48%).

Several priority items emerged as important factors to facilitate the physician's work. Better equipment and improved salaries were expected responses from the subjects. Qualified nursing staff emerged as an important priority for both hospital (66%) and community clinic/health centre (55%) physicians. This finding suggests that poor quality of nursing staff affects physician work performance in both locations.

For medical education, physicians chose responses highlighting the need to change the culture of medical education and its processes among present and future Iraqi physicians. These included changes in teaching styles and fostering educational opportunities both domestically and abroad. Respondents also linked physician education to their social status in the country. Building professional skills, like medical ethics (62%) and administrative or leadership skills (60%), were also central to improving physician status at the local and national level. The subjects saw international collaboration with foreign medical schools (56%) as a way to improve the quality of physician education and the sociopolitical status of physicians. Subjects may have responded in that way due to the lack of quality of medical education infrastructure in the country.

For physical infrastructure, fully three-quarters of all physicians (75%), regardless of specialty, believed that building new facilities was a better option than renovating existing ones. Service line improvements that facilitate hospital physician to work distantly followed as a priority and included laboratory (66%), pharmacy (56.4%) and primary care (55.8%) services improvements.

Once physicians indicated the priorities that facilitated their role performance and medical education (entry level and continuing), the survey then asked physicians to indicate which diseases or conditions should receive focus from ministry of health policy-makers. Reflecting the sociopolitical state of the country as a whole, physicians indicated infectious diseases (excluding HIV/AIDS and STDs; 73%), primary care (58%), childhood illnesses (58%), traumatic injuries (56%) and heart disease (54%) as the top areas for focus. Cancer, diabetes, psychiatric conditions, sexually transmitted diseases and HIV/AIDS were not indicated as priorities at the time.

The finding about cancer and psychiatric conditions were somewhat surprising. We thought this might be a priority area as it was a top priority for Iraqi nurses (Squires *et al.* 2006). In addition, we also thought the stressful effects of dictatorial oppression, war and ongoing violence might have made treating psychiatric conditions, like post-traumatic stress disorder, higher on the priority list. This condition, however, is neither well known in the public nor has there been enough 'safe space' to acknowledge its presence in society. Some clinicians do recognise its presence among their colleagues, but at the time of the survey, and at present, neither time nor resources to address the issue are available given the current state

of the country. Finally, due to cultural norms about sexuality, and a relatively low prevalence of HIV/AIDS in the country, the low-priority rating received from physicians for the HIV/AIDS and STDs items was to be expected. With increased international traffic and travel of people living in the region, HIV/AIDS and STDs may quickly emerge as a larger issue.

The effect of gender, specialty and geography

The authors sought to determine if gender specialty, and geographic location of the physicians affected how they responded in the survey. Tables 3–5 outline the survey items where the three factors significantly affected physician responses.

Initially, it appeared that the virtual uniformity of responses, regardless of gender, suggested that physician socialisation processes may offset the influence of gender when it comes to support for system level reforms. Upon closer examination of female responses the results showed that when compared to their male counterparts, female physicians in the study responded more homogenously to the questions with nearly two-thirds of their responses within a five-point difference of each other. Overall, priorities did not differ greatly by gender but there were differences in each of the six priority areas (see Table 3). Controlling for specialty, female physicians were less likely to list salary improvement in hospitals and clinics as a priority compared to male physicians. Regarding medical education, only 36% of female physicians viewed updating the medical curriculum as a priority compared to male physicians (45%). Fewer felt development of leadership skills was an important priority. Female physicians viewed primary care as a priority, whereas male physicians viewed heart disease as a priority. Both heart disease and primary care, however, are top priorities overall.

Specialty affected physician responses in 16 priorities across five of the six top priority areas. Nine out of 16 items where disagreement between specialties occurred appeared in the top five priorities for reconstruction. There were no differences by specialty regarding priorities for primary care health centres. Eight of 10 conditions were characterised differently as priorities by the various specialties, three of which were significant at $p < 0.0008$.

A few examples highlight the response differences between specialties. To begin, 66% of surgeons made new medical equipment a top priority while wide disagreement among specialties occurred in the area of developing primary care treatment and prevention services. Fewer OB/GYN physicians (37) compared to other specialties listed heart disease as a priority. Only 50% of surgeons viewed primary care as a priority, where 58–72% of other specialties considered it as a priority. Childhood illness was seen as a priority by 69% of OB/GYN physicians and 74% of pediatric physicians. Lastly, 85% of pediatric physicians listed improving laboratory services as a priority.

One factor proved more important than gender or specialty when determining physician priorities for responses: geography. Where physicians lived and worked in the region proved the most significant factor influencing physician responses, with over a third of responses affected by geographic factors and three top five priority responses also affected. These data suggest that there is great geographic variability in infrastructure, resources, leadership and other factors which play a role in shaping provider responses. To illustrate, in reflection of the epidemiologic differences between the four regions, physicians prioritised nine diseases or conditions differently (six if using the alpha of 0.0008). Although significant only before the Bonferroni correction, 71% of physicians from Dohuk listed traumatic injuries as a priority area, which is greater than other geographic locations. In contrast, 87% of physicians in Kirkuk listed infectious diseases as a priority and 69% did the same for childhood illness. A higher proportion of physicians in Suleimaniyah (45%) considered

HIV/AIDS as a priority while less than 33% of physicians in other locations considered it as a priority. Finally, 52% of physicians in Erbil considered diabetes as a priority (higher than the other locations) while 55% considered primary care services development as a priority (lower than other locations).

Another priority area that differed by geographic location is that of building health system physical infrastructure. Building more hospitals and improving laboratory services were priorities for 80% of physicians, except in Dohuk. Only 18% of physicians from Dohuk thought renovating hospitals was a priority, a substantially smaller proportion compared to other locations like Suleimaniyah where 67% of physicians indicated that improvement of primary care services was a priority.

Regarding medical education, Dohuk and Kirkuk physicians tended to list foreign experiences in developed countries as a priority (77% and 70%, respectively). Findings that were specific to Dohuk include 77% of Dohuk physicians supporting post-graduate education as a priority and although not significant at $\alpha = 0.0008$, 67% of Dohuk physicians felt increasing collaboration with foreign medical schools is a priority to help for improving the role and status of physicians. For Kirkuk, the survey indicated that a medical leadership gap may be present in Kirkuk as physicians there were more likely to indicate a need to develop leadership skills among physicians as a priority.

Availability and access to medical supplies and equipment appear to differ between geographic locations. For example, only 12% of Dohuk physicians listed new equipment for vital signs as a priority, compared to 53% of physicians from Kirkuk. In addition, a greater proportion of Dohuk physicians listed improving rural district administration and need for better qualified nurses and staff as priorities (63% and 72%, respectively). Physicians in Erbil and Kirkuk indicated that medications for patients were a greater priority for patient care in their areas as opposed to their colleagues in Dohuk and Suleimaniyah.

The analysis of geographic factors and the types of responses affected highlight the resource disparities between the four locations in the study. Epidemiologic and system management differences between them also appear in the results.

Survey comments

Of all the participants in the study, 189 (19%) chose to make 361 additional comments about health system reconstruction in the survey. General thematic coding techniques guided the analysis of the comments. Thematically, comments fell into administrative (35%), education (26%), physical infrastructure (22%), quality of life (10%) and general comments about the survey itself (8%).

Under the administrative theme, physicians commented most frequently about their salaries and the overall organisation of the healthcare system. Comments in this section provided more specific information than just the survey responses about how to organise physician practice, manage private practice versus employment in government institutions, patient safety and increasing primary care to reduce demand for acute care services.

The majority of physician comments in the education theme focused on studying abroad and reinforced the survey findings in that area. Reasons for the large number of comments in this section may be due to a history of international educational exchanges among physicians in the region, the perception that current domestic educational infrastructure is inadequate to meet their training needs, or simply the desire to leave the country until stability increases.

For comments about physical infrastructure, physicians regularly mentioned new equipment and improving facilities where they work. Physicians made the most statements about the need for new laboratory equipment, thus further reinforcing the finding that 'improved laboratory services' is a top five priority in health system reconstruction. Remarks about facilities, however, were particularly fascinating because of their specialty focus. Physicians frequently noted the need for specialty oriented hospitals including orthopedics, cardiothoracic surgery, obstetrics and gynecology, and general and surgical dental services. Furthermore, reflecting the bias in the sample towards hospital-based physicians, few commented about building more community health centres to expand primary care services.

Physicians provided explanations about the quality of life issues they faced, but mostly in reference to the workplace. Some comments were about direct services, like improving hospital food services for employees. Yet most of their statements focused on improving workplace relationships and changing physician behaviours, both of which resist change. One physician described what would improve the quality of their working lives:

We all [have had a] need for educational refreshment for years. Nobody knows how hospitals outside [the country are] dealing with patients. Nobody knows whether they do a good job or a bad job. Re-evaluation is recommended for all of us regarding ethics, knowledge, attendance, medical behaviour, number of patients seen per year, number of deaths per year, number of presentations at conferences, sharing knowledge, etc.

The comment suggests that fostering professionalism and its associated behavioural elements along with performance evaluations might be a way to improve both physician quality of life and quality of care.

Finally, physician comments about the survey itself reinforced that the survey captured appropriate data about health system reconstruction, even without previous psychometric testing. Physicians repeatedly wrote that they believed the survey was a valuable exercise, that they were pleased to have their input included in the policy-making process, and many simply wrote 'thank you'. Nonetheless, some did express skepticism that the results of the survey would actually be used for health system reconstruction. The latter point reinforces the need for transparent dissemination of these kinds of survey results.

Discussion

Several limitations emerged during this study. First, the lack of experience of the data collection volunteers and subjects may have affected the data collection process, such as the failure to collect data about age. The political situation in the country may have biased results towards the most positive responses to avoid controversy or identify oneself as a troublemaker. For the statistical analysis, the methods used in this study are robust but limited by only controlling for one variable. Thus, limits in this kind of study relate primarily to bivariate analyses and bivariate analyses controlling for one other variable.

We also recognise that using only face validity for instrument validation may weaken the findings overall. Since the survey items conform to the core themes for health system reconstruction recommended by WHO (2005), we believe the results are a valid representation of physician perspectives in the region. Survey replication or factor analysis would help to confirm the reliability and validity of the instrument.

Despite these limitations, overall the findings from this study highlight several important issues with regard to health system reconstruction policy-making. First, policy-makers would be well served if they integrated practitioner input into policy-making processes. The

fact that this study received a thousand responses indicates that even after living under oppressive and unstable circumstances, individuals are willing to offer their feedback. This seems like a very simple concept but provider input, beyond a select group of elites, does not occur as often as policy-makers recommend.

Gender proved to be an important dimension that could influence healthcare professional support for health system reforms. The significant differences between male and female physicians on key findings suggest that male and female physicians will have different perspectives about health system policy-making and, subsequently, different priorities. When policy-makers need to garner support for policy changes, they may face more resistance than anticipated if reforms are biased towards or discriminate against the perspectives of one sex over another.

The results also show that considering variables like physician specialty and geographic location may shed light on potential resistance or support for health system policies from key actors like physicians. The geographic findings, in particular, illustrate the importance of developing decentralised, regional policies that fit the healthcare needs of the population and the providers residing there.

Another important finding from this study was the emphasis physicians placed on working with 'qualified' nursing staff. Both hospital and community health centre physicians responses suggested that poor quality nursing staff affects their ability to do their jobs and the quality of care they provide to their patients. Research demonstrates that the quality of the working relationship between physicians and nurses is a significant indicator of burnout among nurses in multiple international studies (Baba *et al.* 1999, Garrett and McDaniel 2001, Pines *et al.* 2002, Hasselhorn *et al.* 2004, Lambert *et al.* 2004). Therefore, a lack of qualified nursing staff may increase the stress experienced by physicians in the workplace. The tension created when working with poorly qualified staff will negatively affect the nurse-physician relationship, add to the tensions of an already stressful work environment and contribute to poorer patient outcomes. Therefore, policy-makers may need to invest equally in developing nursing human resources as they do in physicians and health system physical infrastructure in order to facilitate the work of physicians and produce the best outcomes for patients.

Another important aspect of this project was that it illustrated how researchers can manage an international study over the internet. Despite such constraints as inconsistent electrical power (sometimes for as little as four hours/day), sporadic on-site internet access and limited financial support, the authors were able to obtain good data that provided useful information for health system reconstruction – even without conducting a site visit. Highly structured coordination between teams, however, is strongly recommended to ensure the best data possible get collected.

Notwithstanding other results from this study, we believe the most significant finding was the sheer complexity of the survey responses from the physicians. The human resources for health literature tend to refer to most healthcare personnel under their collective titles of 'physicians' or 'nurses', making the groups seem more homogenous and organised than they may actually appear. Yet this study demonstrates that variables such as specialty, geographic location and gender will influence responses and professionals may not be as internally unified as they seem. Surveys like this also shed light on the internal political dynamics of a profession. Said dynamics may help or hinder changes in a healthcare system, especially when it comes to profession specific policies that affect their work.

Finally, even though these data are from 2005, other studies conducted shortly after ours show similar findings and do not indicate significant progress in health system

reconstruction beyond a few new facilities for health services delivery (i.e., Gerber 2007) – a priority for many physicians in the study. Politically, new hospitals are the easiest and most visible marker of progress and growth, even if the facilities are not well staffed, well resourced, or at peak operating capacity. To the public, they are symbols of progress and stability, of starting anew. Public expectations change with stability and a mother with a very sick child will not care how pretty a hospital looks if the personnel there do not have the knowledge, skills and resources to treat her child. Building the professional infrastructure that improves the quality of physician education and the subsequent treatments they provide to the public will be a much longer process. Health services delivery and professional institutional infrastructure have a symbiotic relationship: one cannot develop or improve without the other in a sustainable system.

Conclusion

Health system reconstruction is a critical element in creating social and political stability in a post-conflict region. While the ongoing political events of Iraq complicate the reconstruction process in the northern part, advancements are occurring slowly. Yet actions often speak louder than words when attempting to generate institutional and system level change. Without some tangible changes that affect the daily lives and practices of healthcare professionals, they will be less likely to support the changes required when reconstructing a healthcare system. This survey illustrates how health system reconstruction is not only about having the physical infrastructure to deliver services, but also about the people who will deliver care in those facilities.

References

- Ahmed AT. Bearing witness. *Journal of the American Medical Association* 2007;298(5):494–495. [PubMed: 17666663]
- Akunjee M, Ali A. Healthcare under sanctions in Iraq: an elective experience. *Medicine, Conflict and Survival* 2002;18(3):249–257.
- Al-Dabbagh, SA.; Al-Tae, WG. Evaluation of a task-based community oriented teaching model in family medicine for undergraduate medical students in Iraq. *BMC Medical Education*. 2005 [Accessed 12 November 2007]. Available from: <http://www.biomedcentral.com/1472-6920/5/31>
- Al-Nassaj HH, Al-Ward NJ, Al-Awqati NA. Knowledge, attitudes, and sources of information on breast feeding among medical professionals in Baghdad. *Eastern Mediterranean Health Journal* 2004;10(6):871–878. [PubMed: 16335775]
- Amin NMM, Koshnaw MQ. Medical education and training in Iraq. *Lancet* 2003;362:1326. [PubMed: 14579817]
- Baba VV, Galperin BL, Lituchy TR. Occupational mental health: a study of work-related depression among nurses in the Caribbean. *International Journal of Nursing Management* 1999;36:163–169.
- Dussault G. The health professions and the performance of future health systems in low-income countries: support or obstacle? *Social Science and Medicine* 2008;66(10):2088–2095. [PubMed: 18336977]
- Eastern Mediterranean Regional Office (EMRO). Human and physical resources indicators for Iraq. Cairo, Egypt: 2007a [Accessed 10 October 2007]. Available from: <http://www.emro.who.int/emrinfo/index.asp?Ctry=irq#PhysicalResources>
- EMRO. Health Professions Education Directory. Cairo, Egypt: 2007b [Accessed 10 October 2007]. Available from: <http://www.emro.who.int/hped/Countries.asp>
- Eliades MJ, Lis J, Barbosa J, VanRooyen MJ. Post-war Kosovo: part 2. Assessment of emergency medicine leadership development strategy. *Prehospital & Disaster Medicine* 2001;16(4):268–274. [PubMed: 12090209]
- Garfield R, Dresden E, Boyle JS. Health care in Iraq. *Nursing Outlook* 2003;51:171–177. [PubMed: 12949477]

- Garfield R, McCarthy CF. Nursing and nursing education in Iraq. *International Nursing Review* 2005;52:180–185. [PubMed: 16033443]
- Garrett DK, McDaniel AM. A new look at nurse burnout: the effects of environmental uncertainty and social climate. *Journal of Nursing Administration* 2001;31(2):91–96. [PubMed: 11271685]
- Gerber, M. Iraq: the socio-economic situation in the KRG Administrated Provinces Sulaimaniyah, Erbil and Dohuk. Bern: Schweizerische Flüchtlingshilfe; 2007.
- Hashim DS, Al-Kubisy W, Al-Dulayme A. Knowledge, attitudes, and practices among health care workers and tuberculosis patients in Iraq. *Eastern Mediterranean Health Journal* 2003;9(4):718–731. [PubMed: 15748069]
- Hasselhorn HM, Tackenberg P, Peter R. Effort-reward imbalance among nurses in stable countries and countries in transition. *International Journal of Occupational & Environmental Health* 2004;10:401–408. [PubMed: 15702754]
- Hawrami SA, Ibrahim N. Experiencing chemical warfare: two physicians tell their story of Halabja in northern Iraq. *Canadian Journal of Rural Medicine* 2004;9(3):178–181. [PubMed: 15603690]
- Hendel T, Fish M, Aboudi S. Strategies used by hospital nurses to cope with a national crisis: a manager's perspective. *International Nursing Review* 2000;47(4):224–231. [PubMed: 11153519]
- Huggan PJ. Health effects of war are devastating: pre-emptive war demands, preemptive criticism by the medical profession. *Internal Medicine Journal* 2007;37:274–275. [PubMed: 17388870]
- Lafta RK. Practitioner gender preference among gynecologic patients in Iraq. *Healthcare for Women International* 2006;27:125–130.
- Lambert VA, Lambert CE, Ito M. Workplace stressors, ways of coping and demographic characteristics as predictors of physical and mental health among hospital nurses in Japan, Thailand, South Korea, and the USA (Hawaii). *International Journal of Nursing Studies* 2004;41:671–684. [PubMed: 15240091]
- Ljubi B. Strategic guidelines for reconstruction and development of health care in the Federation of Bosnia-Herzegovina [Croatian]. *Medicinski Arhiv* 1998;52(1):5–10. [PubMed: 9623083]
- Pines AM, Ben-Ari A, Utasi A, Larson D. A cross-cultural investigation of social support and burnout. *European Psychology* 2002;7(4):256–264.
- Reis C, Ahmed AT, Amowitz LL, Kushner AL, Elahi M, Iacopino V. Physician participation in human rights abuses in southern Iraq. *Journal of the American Medical Association* 2004;291(12):1480–1486. [PubMed: 15039415]
- Shaikh IA, Shaikh MA, Rasheed BO. Job satisfaction among male physicians: perspectives from northern Iraq. *Journal of the College of Physicians & Surgeons Pakistan* 2006;16(5):329–332. [PubMed: 16756775]
- Soeung S, Grundy J, Kamara L, McArthur A, Samnang C. Developments in immunization planning in Cambodia – rethinking the culture and organization of national program planning. *Rural & Remote Health* 2007;7(2):630. [PubMed: 17508838]
- Squires A, Sindi A, Fennie KP. Reconstructing a health system and a profession: priorities of Iraqi nurses in the Kurdish region. *Advances in Nursing Science* 2006;29(1):55–68. [PubMed: 16495688]
- WHO. Guide to health workforce development in post-conflict environments. Geneva: World Health Organisation; 2005.

Figure 1.
Map of northern Iraq.

Table 1

Demographic characteristics of respondents.

Characteristic	Percent of subjects (<i>n</i> = 1001), (%)
Gender (missing <i>n</i> = 12)	
Female (<i>n</i> = 293)	29
Male (<i>n</i> = 695)	71
Geographic location (missing <i>n</i> = 5)	
Dohuk (<i>n</i> = 151)	15
Erbil (<i>n</i> = 398)	40
Kirkuk (<i>n</i> = 150)	15
Suleimaniyah (<i>n</i> = 297)	30
Education level	
M.B., Ch. B (<i>n</i> = 700)	74
One-year diploma (<i>n</i> = 97)	10
Two-year diploma (<i>n</i> = 102)	11
Board degree (<i>n</i> = 80) ^a	9
Higher degree (<i>n</i> = 21)	3
Primary place of employment	
Health centre (<i>n</i> = 185)	18
Hospital (<i>n</i> = 683)	68
Medical college/educational institution (<i>n</i> = 9)	1
Ministry of health (<i>n</i> = 107)	11
Other (<i>n</i> = 17)	2
Position	
Resident (<i>n</i> = 120)	12
House officer (<i>n</i> = 260)	26
Senior house officer (<i>n</i> = 130)	13
General practitioner (<i>n</i> = 190)	19
Specialist (<i>n</i> = 290)	29
Other (<i>n</i> = 7)	1

^a Board certification is in addition to basic medical education in Iraq; thus the numbers add up to more than 100%.

Table 2

Top five responses by priority areas for health system reconstruction, listed in order of importance.

Priority area	Percent of respondents (%)
Five most important areas to facilitate <i>hospital physician's work</i>	
Better diagnostic and laboratory equipment	78
Qualified nursing staff	66
Improved salaries	61
New medical equipment	56
Medications for patients	49
Five most important areas to facilitate <i>health centre physician's work</i>	
Specialised training in community and public health	63
Patient education materials	62
Improved salaries	58
Qualified nursing staff	55
Vaccine supplies	48
Five most important areas to develop <i>medical education and training</i>	
Increase post-graduate study opportunities to promote life-long learning	60
Increase availability of educational experiences abroad	58
Foster medical student eagerness to study medicine	55
Develop more interactive classroom teaching styles	54
Improve access to educational resources to enhance learning	53
Five best ways to <i>improve the status and role of physicians</i> at the local and national level	
Develop new ways to educate physicians	64
Promote medical ethics to regulate behaviour and practice	62
Improve administrative and leadership skills of physicians	60
Increase collaboration with foreign medical schools	56
Create a union to defend physicians in the workplace	55
Five most important priorities to <i>rebuild physical infrastructure</i>	
Build more hospitals	75
Improve laboratory services	66
Improve pharmacy services	56
Improve primary care services	56
Buy new equipment for patient care	55
Five most important <i>diseases or conditions</i> to develop treatment and prevention services	
Infectious diseases	73
Primary care	63
Childhood illnesses	58
Traumatic injuries	56
Heart disease	54

Table 3

Priorities differing by gender.

Survey item	In Top 5	Male, <i>n</i> (%)	Female, <i>n</i> (%)
Priorities for doctors working in hospitals			
Improve salaries for hospital physicians ^{*,**}	✓	444 (64)	157 (54)
Priorities for doctors working in health centres			
Increase vaccine supplies [*]		318 (46)	155 (53)
Improve salaries for community clinic physicians ^{*,**}		416 (60)	156 (53)
Priorities for medical education and training			
Increase number of qualified instructors [*]		292 (42)	146 (50)
Update the medical education curriculum ^{*,**}		314 (45)	105 (36)
Priorities to improve role and status of doctors			
Develop leadership skills of physicians ^{*,**}	✓	329 (47)	114 (39)
Priorities to develop treatment and prevention services			
Heart disease ^{*,**,***}	✓	411 (59)	126 (43)
Primary care ^{*,**}	✓	413 (60)	212 (73)
Priorities to build health system physical infrastructure			
Ensure adequate supplies for patient care ^{*,**}		277 (40)	142 (49)
Improve primary care services ^{*,**}		371 (54)	181 (62)

* Significant at $\alpha = 0.05$ unadjusted;** $\alpha = 0.05$ adjusted for specialty;*** $\alpha = 0.0008$ adjusted for specialty (Bonferroni correction for multiple tests).

Table 4

Priorities differing by specialty.

Survey Item	In Top 5	Surgery, n (%)	Medicine, n (%)	OB/GYN, n (%)	Peds, n (%)	Other, n (%)
Priorities for doctors working in hospitals						
Medications for patients*	✓	114 (43)	198 (50)	61 (57)	56 (57)	41 (41)
Need for new medical equipment* ***	✓	174 (66)	196 (50)	53 (49)	56 (57)	59 (58)
Priorities for doctors working in health centres						
None differed by specialty		—	—	—	—	—
Priorities for medical education and training						
Improve educational environment*		135 (51)	168 (43)	56 (52)	51 (52)	38 (38)
Improve access to educational resources*	✓	150 (57)	189 (48)	64 (59)	59 (60)	57 (56)
Change policy of practical sessions*		89 (34)	135 (34)	36 (33)	32 (32)	19 (19)
Priorities to improve role and status of doctors						
Develop leadership skills of physicians*	✓	138 (52)	167 (42)	48 (44)	33 (34)	50 (50)
Priorities to develop treatment and prevention services						
Cancer care*		141 (53)	165 (42)	54 (50)	39 (40)	55 (54)
Heart disease*, ***	✓	143 (54)	228 (58)	40 (37)	47 (48)	63 (63)
Primary care*, ***	✓	132 (50)	271 (69)	78 (72)	71 (73)	59 (58)
Childhood illnesses*, ***	✓	131 (50)	233 (59)	74 (69)	72 (74)	52 (52)
Traumatic injuries*	✓	177 (67)	206 (52)	55 (51)	50 (51)	54 (54)
Infectious diseases*	✓	180 (68)	302 (77)	66 (61)	81 (83)	74 (73)
HIV/AIDS*		110 (42)	108 (27)	37 (34)	30 (31)	38 (38)
Sexually transmitted disease*, ***		89 (34)	149 (38)	50 (46)	27 (28)	19 (19)

Survey item	In Top 5	Surgery, n (%)	Medicine, n (%)	OBGYN, n (%)	Peds, n (%)	Other, n (%)
Priorities to build health system physical infrastructure						
Build more health centres *		140 (53)	213 (54)	46 (43)	39 (40)	65 (64)
Improve laboratory services *, ***		152 (58)	266 (68)	71 (66)	83 (85)	59 (59)

* Significant at $\alpha = 0.05$;

*** $\alpha = 0.0008$ (Bonferroni correction for multiple tests).

Table 5

Priorities differing by geographic location.

Survey Item	In Top 5	Dohuk, n (%)	Erbil, n (%)	Kirkuk, n (%)	Suleimaniyah, n (%)
Priorities for doctors working in hospitals					
Medications for patients ^{*,***}	✓	48 (32)	217 (55)	86 (57)	135 (46)
Qualified nursing staff ^{*,***}	✓	94 (63)	235 (59)	106 (71)	220 (74)
Good interpersonal and interdepartmental relations [*]		56 (38)	172 (43)	39 (26)	108 (36)
Quality assurance measures [*]		46 (31)	94 (24)	24 (16)	56 (19)
Improved salaries ^{*,***}	✓	123 (83)	235 (59)	96 (64)	152 (51)
Priorities for doctors working in health centres					
New equipment for vital signs ^{*,***}		18 (12)	174 (44)	79 (53)	114 (39)
Specialised training in community and public health [*]	✓	101 (68)	231 (58)	92 (61)	205 (69)
Improve rural district administration ^{*,***}		94 (63)	153 (38)	57 (38)	123 (41)
Standardise documentation of health information [*]		46 (31)	167 (42)	57 (38)	94 (32)
Provide patient education materials ^{*,***}	✓	63 (42)	266 (67)	96 (64)	188 (63)
Need better qualified nurses and staff ^{*,***}	✓	107 (72)	214 (54)	63 (42)	163 (55)
Improve first aid supplies [*]		53 (36)	198 (50)	67 (45)	155 (53)
Priorities for medical education and training					
Facilitate student enthusiasm for medical education ^{*,***}	✓	61 (41)	261 (66)	70 (47)	152 (51)
Improve the educational environment [*]		69 (46)	182 (46)	87 (58)	126 (43)
Change lecture styles to more interactive [*]	✓	65 (44)	245 (62)	78 (52)	155 (52)
Increase the number of qualified		44 (30)	191 (48)	58 (39)	148 (50)

Survey item	In Top 5	Dohuk, n (%)	Erbil, n (%)	Kirkuk, n (%)	Suleimaniyah, n (%)
instructors , ***					
Increase post-graduate study opportunities , ****	✓	114 (77)	219 (55)	66 (44)	199 (67)
Improve financial support for medical students *		90 (60)	181 (46)	86 (57)	165 (56)
Increase experiences available in developed countries , ****		115 (77)	196 (49)	105 (70)	159 (54)
Priorities to improve role and status of doctors					
Develop physician leaders *	✓	54 (36)	191 (48)	79 (53)	123 (41)
Develop elite physician educators , ****		45 (30)	191 (48)	46 (31)	93 (32)
Organise union or syndicate for physicians *		83 (56)	241 (61)	64 (43)	162 (55)
Promote medical ethics , ****		95 (64)	215 (54)	103 (69)	207 (70)
Encourage studying public health , ****		40 (27)	101 (25)	49 (33)	116 (39)
Increase collaboration with foreign medical schools *	✓	99 (67)	213 (54)	83 (55)	164 (56)
Introduce new ways to educate physicians , ****		110 (74)	223 (56)	112 (75)	187 (63)
Priorities to develop treatment and prevention services					
Cancer care , ****		74 (50)	215 (54)	67 (45)	113 (38)
Traumatic injuries *	✓	105 (71)	213 (54)	83 (55)	153 (52)
Infectious diseases , ****	✓	112 (75)	260 (65)	130 (87)	221 (74)
HIV/AIDS , ****		31 (21)	119 (30)	48 (32)	133 (45)
Sexually transmitted diseases *		33 (22)	154 (39)	51 (34)	107 (36)
Psychiatric conditions *		45 (30)	164 (41)	41 (27)	112 (38)
Heart disease *	✓	91 (61)	235 (59)	71 (47)	142 (48)
Diabetes , ****		55 (37)	208 (52)	53 (35)	115 (39)
Primary care , ****	✓	107 (72)	219 (55)	102 (68)	203 (69)

Survey item	In Top 5	Dohuk, n (%)	Erbil, n (%)	Kirkuk, n (%)	Suleimaniyah, n (%)
Childhood illness ^{*,***}	✓	87 (58)	200 (50)	103 (69)	187 (63)
Priorities to build health system physical infrastructure					
Build more hospitals ^{*,***}	✓	119 (80)	330 (83)	102 (68)	196 (66)
Renovate existing hospitals ^{*,***}		26 (18)	164 (41)	60 (40)	102 (35)
Build more community health centres [*]		76 (51)	222 (56)	83 (55)	132 (45)
Renovate existing community health centres ^{*,***}		18 (12)	120 (30)	47 (31)	73 (25)
Ensure adequate supplies for patient care [*]		55 (37)	165 (42)	55 (37)	149 (50)
Improve primary care services ^{*,***}	✓	87 (58)	179 (45)	91 (61)	199 (67)
Improve secondary and tertiary care services [*]		57 (38)	110 (28)	55 (37)	109 (37)
Improve laboratory services ^{*,***}	✓	118 (80)	263 (66)	100 (67)	172 (58)

* Significant at $\alpha = 0.05$;

*** $\alpha = 0.0008$ (Bonferroni correction for multiple tests).