



***Saudi Arabia–United States
Collaboration in Health Research:
A Formula for Success***

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Saudi Arabia–United States collaboration in health research: A formula for success

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The aim of this article is to share our experiences from an international collaborative effort to study health outcomes among Saudi Arabian National Guard (SANG) soldiers following the 1991 Gulf War. By paying particular attention to distinct social and religious customs, geopolitical differences, and unique aspects of the health care system, we achieved a successful international collaboration in health research. (Am J Infect Control 2005;33:192-6.)

International collaborations offer new perspectives and important opportunities for health researchers to share information, experiences, and methods that can provide the basis for population-based health studies of mutual interest. Collaborations that involve completely different cultural settings also present unique challenges. We assembled a team of 10 researchers: 2 from the Kingdom of Saudi Arabia and 8 from the United States to collaborate on a study of health outcomes

among Saudi Arabian National Guard (SANG) soldiers following the 1991 Gulf War.¹ In addition to distinct geopolitical differences, these 2 nations have vastly differing social and religious customs, languages, and health care systems. In this article, we describe our experiences with a successful international research collaboration. Our study findings are reported elsewhere.¹

Our research collaboration was initiated in response to talks between the Chief Executive Officer of the Saudi Arabian National Guard Health Affairs at King Abdul Aziz Medical City (KAMC), formerly known as King Fahad National Guard Hospital, based in Riyadh, Kingdom of Saudi Arabia; and the Assistant Secretary of Defense for Gulf War Illnesses, US Department of Defense (DOD). The purpose of our study was to complement the multinational, more than decade-long research endeavor that has attempted to characterize the morbidity reported among some veterans of the 1991 Gulf War.²⁻³⁸ To establish the feasibility of a Saudi-US research collaboration and to ensure support for the initial study proposal through the appropriate Saudi channels, a 4-member team of US researchers from the Uniformed Services University of the Health Sciences (USUHS), Bethesda, Maryland, and the Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, as well as a representative from the Office of the Assistant Secretary of Defense for Gulf War Illnesses traveled to Saudi Arabia in late 1998. Data collection efforts subsequently began in earnest in 1999 when 8 investigators from the United States (USUHS, CDC, and the Naval Health Research Center, NHRC) joined the 2 principal Saudi researchers in Riyadh to inventory and evaluate multiple, potential sources of health data at

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KAMC, as well as other health care facilities in the Riyadh area. The senior status and size of the research group lent credibility to the collaborative effort and gave impetus to the process of obtaining data-use authorization. Members of the research team had expertise in epidemiology, biostatistics, data programming and analysis, and database management, as well as familiarity with the health issues surrounding the 1991 Gulf War.^{6,10-16,29-33} In addition to the small, existing US military presence in Riyadh, the CDC was a well-known entity at KAMC because of its previous sponsorship of in-country epidemiologic training. Saudi coinvestigators, based at KAMC, provided technical expertise and key liaison with professional staff and senior hospital and SANG military leadership. The diverse nature of the research team ensured positive interactions with clinicians, pharmacists, hospital administrators, and information systems managers at KAMC.

The context for the SANG health study revolved around the lingering concerns over multisymptom conditions reported by some US veterans deployed to the 1991 Gulf War, as well as similar self-reported symptoms among some of the other coalition forces (e.g., United Kingdom, Canada, and Australia).^{3,5,6,12,15,23,35-38} The opportunity to explore the health impact of the Gulf War on a coalition force native to the Gulf region was timely and held the promise of adding a unique perspective to our growing knowledge base on the possible health effects of deployment. At the same time, the distinct features of this research setting posed a number of challenges. For purposes of discussion, we have grouped these challenges into 3 topic areas: (1) sociocultural (language, family structure, religious observances, role of women, and social customs); (2) geopolitical (political climate, governance, and geographic/environmental factors); and (3) health care systems (eligibility, information systems, utilization patterns, and patient confidentiality issues).

SOCIOCULTURAL CHALLENGES

As members of a Saudi-US research team, we were keenly aware of the differences between our 2 nations outside the domain of science. Some of these differences had the potential to affect our ability to access data, construct an analyzable data set, and interpret our findings. Saudi researchers on the team played an essential role in facilitating data collection by removing barriers that could have impeded progress on our study.

Language differences complicated all aspects of our study. For example, personnel data from SANG Headquarters were in the form of paper records written in Arabic. As a result, each data field required translation into English prior to being key entered into a database.

Additionally, a large number of SANG members had exactly the same name because of the Saudi propensity to use certain given and surnames. Saudi clans or extended family members can potentially number in the millions, and perhaps hundreds in a village can have identical names. These and other language issues complicated the process of assembling appropriate study and comparison groups. On the other hand, both Saudi investigators on our research team spoke fluent English, thus enhancing our ability to discuss study objectives, data requirements, and analysis plans as we implemented the protocol.

Complete accounting of family members was also challenging because of notable differences in family structure. For example, it is not unusual for SANG enlisted members to have 2 or 3 wives and 10 or more children in their household.

As guests in the Kingdom, it was essential for US researchers to be considerate of religious customs, such as Islamic prayer times. The 3 US women on the research team had to adjust to the distinct role of women in a Muslim society and were appropriately respectful of local customs related to dress, religious observances, and restricted movement in public. For instance, women are only allowed in certain areas (family restaurants) for public dining or in designated seating areas in public places. In addition, Saudi women are prohibited from driving vehicles or being seen in public unless accompanied by a spouse or adult male relative. Our visit to SANG Headquarters to request personnel data was an extraordinary event because it included the entire research team, and women are generally not allowed within this compound. The US women dressed appropriately in long-sleeved, full-length over-garments, called *abeyas*, and covered their heads. Senior SANG officials were gracious hosts, welcoming the entire group.

GEOPOLITICAL CHALLENGES

Travel to the Kingdom of Saudi Arabia by the team of US researchers was allowed only under official government orders and required high-level support from the US Office of the Assistant Secretary of Defense and Saudi Arabian National Guard Health Affairs. Entry into the Kingdom was facilitated by US military officers assigned to SANG. Travel plans were coordinated to avoid conflict with religious observances, such as Ramadan or Christmas, as well as to avoid extremes in the physical environment. As international travelers, we had to remain aware of current political sensitivities and global events that could affect our safety and our ability to travel freely.

Scheduling of teleconferences had to take into account at least 10 time zones, when the entire

research team was involved, to connect the Western US and points in-between to Riyadh, Saudi Arabia. In addition, meetings and teleconferences had to allow for differences in how the workweek is defined in Saudi Arabia and the United States. For Saudis, Thursday and Friday correspond to Saturday and Sunday in the United States. Thus, there was overlap on only 3 days of the workweek.

Although our research team communicated regularly by e-mail and held periodic teleconferences to discuss data and analytic issues, we found that face-to-face meetings played a critical role in resolving a number of methodologic issues, such as addressing data inconsistencies or missing data, placing analytic results in proper context, and interpreting unusual results. For example, Saudi researchers traveled to the United States to facilitate the initial analyses and to assist with data quality control procedures. In addition, the Saudis provided insight into secular trends within the Kingdom to help interpret study findings. This enabled discussion and key decision making to take place prior to construction of a final analytic data set and smoothed the process of manuscript preparation. Even though much work on the manuscript was accomplished by e-mail and telephone communications, it was still important for the whole team to travel to a central location and meet to finalize manuscripts for publication.

SANG HEALTH CARE SYSTEM

King Abdul Aziz Medical City is a tertiary care referral center in Riyadh, including a 560-bed hospital. Universal health care is provided to SANG soldiers and their family members, as well as military retirees. Each hospital visit generates an electronic record with a sequential medical record number associated with a unique SANG identification number. The SANG identification number is used for health care eligibility by SANG family members and sometimes by extended family members, but each patient has his own individual medical record. By introducing a system of taxonomy for soldiers or family members into the automated records, we were able to distinguish the categories.

Although vital statistics reporting is mandatory in Saudi Arabia, these data presented some challenges. Cause of death is usually recorded as "cardio-respiratory arrest," and autopsies are generally not conducted. Date of birth information is not based on the Gregorian calendar but instead on the lunar year. Also, by custom, if the date of birth is unknown, Saudi citizens use a fixed day and month based on royal decree.

The majority of SANG troops are Bedouin, traditionally nomadic desert dwellers, serving as full-time

domestic security forces in local geographic regions, and the vast majority are likely to remain in the SANG over their entire career. In general, SANG soldiers are characterized as stoic and not likely to seek health care for minor complaints. Differences in how SANG soldiers perceive health and illness and the impact of this perception on health care-seeking behaviors likely affected utilization patterns. In fact, speculation concerning possible adverse effects of the 1991 Gulf War was not a priority among the Saudi health care providers or the SANG military leadership, and the notion that illnesses in Gulf War veterans might well represent a condition unique to English-speaking peoples was mentioned by SANG health care providers more than once during informal discussions.

As is the case with US health care institutions, Saudi health care institutions also generally regard the sharing of individual level health data as potentially problematic. Therefore, adequately addressing patient confidentiality issues assumed the highest priority. We obtained approvals from all appropriate institutional review boards (USUHS, KAMC, CDC, and NHRC) and took measures to ensure high-level support for our project before data collection was initiated. The endorsement of the former Chief Executive Officer of Saudi Arabian National Guard Health Affairs was critical. The data team devised a process to conduct data linkages using unique study identifiers to maintain individual record integrity without retaining personal identifying information as part of the final analytic data set.

CONCLUSIONS

To our knowledge, this endeavor was the first epidemiologic investigation of postwar health outcomes among coalition forces native to the Gulf region following the 1991 Gulf War. In addition to methodologic issues, the members of the Saudi-US team of scientists had to remain aware of and sensitive to the differences between our 2 societies, which impacted all phases of our research collaboration. By paying particular attention to distinct social and religious customs, geopolitical differences, and unique aspects of the health care system, we achieved a successful international collaboration in health research.

In addition to all that we learned about the process of gathering information on health outcomes in an international setting, we gained much in the area of improved cross-cultural understanding and cooperation, which will benefit both Saudi and US scientists engaged in future health research. Despite the many challenges, the foundation for future Saudi-US scientific collaboration was established, including the potential for establishing a broad-based, multinational health surveillance system for the mutual benefit of

all participants. The Middle East in general, and the Arabian Gulf region in particular, take on added significance, given current political events and the likelihood of continued multinational operations, military and/or humanitarian, in that area of the world. Our experience contributes toward building a global network of culturally competent scientists committed to population health research. We recommend that future opportunities for international collaborative research be encouraged and supported.

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14. ABSTRACT (maximum 200 words)
Background International collaborations offer new perspectives and important opportunities for health researchers to share information, experiences, and methods that provide the basis for population-based health studies of mutual interest. Collaborations that involve completely different cultural perspectives also present distinct challenges. We share our experiences following a successful international collaboration to study health outcomes among Saudi Arabian National Guard (SANG) soldiers following the 1991 Gulf War.
Methods Our study involved a multidisciplinary team, including two physician researchers from the Kingdom of Saudi Arabia and eight researchers from the United States with expertise in epidemiology, preventive medicine, occupational medicine, biostatistics, data programming, and analyses.
Results The findings from our epidemiological study are reported separately. In this commentary, we address some of the major distinctions between the Kingdom of Saudi Arabia and the United States, including geopolitical, social and religious, as well as healthcare system and language differences that had an impact on our research collaboration.
Conclusions Despite the challenges, our international collaboration was a very worthwhile experience. In addition to all that was learned about the process of gathering information on health outcomes in an international setting, we also gained much in the area of improved cross-cultural understanding and cooperation, which can contribute to a global network of scientists committed to building a science-based foundation for health research

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