CONCEPTS

Implementing an Emergency Medical Services System in Kathmandu, Nepal: A Model for “White Coat Diplomacy”

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Wilderness medicine providers often visit foreign lands, where they come in contact with medical situations that are representative of the prevailing healthcare issues in the host countries. The standards of care for matters of acute and chronic care, public health, and crisis intervention are often below those we consider to be modern and essential. Emergency medical services (EMS) is an essential public medical service that is often found to be underdeveloped. We describe our efforts to support development of an EMS system in the Kathmandu Valley of Nepal, including training the first-ever class of emergency medical technicians in that country. The purpose of this description is to assist others who might attempt similar efforts in other countries and to support the notion that an effective approach to improving foreign relations is assistance such as this, which may be considered a form of “white coat diplomacy.”

Key words: emergency medical services, EMS, Nepal, out-of-hospital care, prehospital care, diplomacy

Introduction

With a passion for travel and adventure, many wilderness medicine providers find opportunities in foreign lands. Invariably, we come in contact with medical situations that are representative of the prevailing healthcare issues in the host countries. Not infrequently, the medical resources available in countries that support our penchant for discovery, exploration, and recreation are not those to which we have become accustomed. The standards of care for matters of acute and chronic care, public health, and crisis intervention are often below those we consider to be modern and essential. So, becoming a traveler beyond the borders of North America, Europe, and other “developed” nations creates the benefit of having opportunities to observe ways in which healthcare professionals might be of assistance to countries.

Nepal is a favorite destination, beloved for the exotic mélange of cultures typified by Kathmandu and for the majestic mountains of the Himalaya. But there are flaws. The Sherpa of Nepal carry our duffels and pull us from

crevasses. When any of these remarkable people falls and breaks a hip, or becomes afflicted with pneumonia, they often must walk or be carried for days to see a local healer to be triaged and treated before transfer to a clinic or hospital for care. A tour guide crossing the street in Bhaktapur thrown to the ground by an errant vehicle has limited or no access to emergency transportation, and is likely to be thrown in the back of a taxi to be deposited at the entrance to an emergency room. The medical profession and facilities are modernizing, but there are still obvious gaps. Creating a cadre of healthcare providers at all levels is potentially sustainable, and a way to improve the situation.

In the spirit of giving something back, offering the skills and teaching of our profession is one way that we can show gratitude, repay kindnesses, and improve the situations of others. This might sometimes be in remote, wilderness-type locations, or it may be in appropriate urban venues. Modernization typically occurs first in urban settings and then spreads into more remote regions of a country. So, it is not counterintuitive to be urban-focused to serve rural or even wilderness populations.

The United States is heavily invested in strategic activities and opportunities abroad. Because international politics are complex, US interventions are often by necessity

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primary reactions to current situations. Although this is a necessary investment of American leadership, it does not always lead to a nation-building approach. In the same sense, global humanitarian relief often provides short-term solutions, but may not create the infrastructure for a country to establish an organized approach to growth and prosperity. Given the ubiquity and commonality of medical needs, creating the capacity to provide essential healthcare services is an opportunity for one nation to offer meaningful service to another. Complementing direct medical assistance with expertise in the development of local and national public health and disaster “safety nets” is a logical extension. A sensitive and effective approach to foreign affairs seems ripe for the ministrations of healers engaged in health system development, who could be considered “white coat diplomats.”

Emergency medical services (EMS) systems are a fundamental component of the public health safety net in countries with mature emergency medicine enterprises and disaster response capabilities. The international medical community recognizes that rapid response and transport lead to improved medical outcomes. In the most developed systems, communication is initiated by calling a 3-digit telephone number, which summons a trained critical care provider to the scene. The skills of responders ensure that key interventions are achieved and patients transported to the most appropriate facility. Specialty centers depend on proficient out-of-hospital (OOH) triage. The importance of initial emergency response for time-sensitive morbidities generated by trauma, systemic infections, heart attacks, and strokes cannot be underestimated.

When one thinks of global health, safe water, infectious disease, obstetric and infant health, and malnourishment often come to mind. However, global patterns of morbidity and mortality in low-income nations are changing. Specifically, road traffic injuries and cardiovascular disease are on the rise in developing nations, even those struggling with malnutrition. As disability-adjusted life-years are calculated and health patterns identified, emergency medical conditions are rising to the forefront of global health priorities. Public health academicians and international organizations have recognized the increasing need for emergency care. The World Health Organization predicts that by 2020, road traffic injuries will be the third largest contributor to the global burden of disease, with 90% of the associated mortality occurring in low-income nations. Given what we know about emergency medicine, particularly as it relates to disaster response, we feel that the time has come for us to share our expertise with nations intending to implement effective EMS.

We discuss development of a centralized EMS system to provide care to people of the Kathmandu Valley in Nepal. Although we describe an individual case study, the issues we encountered should be expected in any nation seeking to develop its own EMS system. Our goal is to share our experiences in the hope that other countries wishing to develop a coordinated EMS system outside the United States might benefit from our observations.

In 2008, the OOH EMS situation in Nepal could be charitably described as ineffective, with no trained providers, no toll-free emergency telephone number or dispatch center, and only a few scattered, ill-equipped vehicles that hardly qualified as ambulances. Most patients were transported to the hospital by taxi. Nearly all patients requiring immediate resuscitation received no treatment before hospital arrival.

Dr. Rajesh Gongal, a general surgeon and Dean of the School of Medicine of the Patan Academy of Health Sciences, Mahesh Nakarmi, an expert in disaster response, and David Amsalem, an undergraduate pre-medical student from Vanderbilt University, led the charge in Kathmandu to recruit local and international partners to assist in creating an ambulance service to provide emergency OOH care. Stanford Emergency Medicine International (SEMI) faculty physicians were invited to complete an on-site needs assessment. All observers concluded that an OOH care system would be needed to best direct limited resources and deliver lifesaving interventions to the people of Kathmandu. Local board members were recruited, and a nonprofit entity, the Nepal Ambulance Service (NAS: www.nepalambulanceservice.org), was created with the mission “to provide rapid ambulance transport to hospitals along with lifesaving medical care by trained emergency medical technicians (EMTs) for sick and injured people regardless of ability to pay.”

The remainder of this paper describes our approach to addressing this situation.

Primary Milestones and Prerequisites

FORMATION OF ACCOUNTABLE GROUP AND COMMITMENT TO SHARED GOALS AND OBJECTIVES

An essential prerequisite for any sustainable development project is local leadership, committed to and accountable for shared goals. A functional EMS system is a business and requires an executive structure. To address the many multidisciplinary challenges posed by EMS, NAS recruited prominent local business leaders, physicians, disaster management experts, and founders of accomplished nonprofits to join the board of directors.

The process of determining organizational hierarchy and objectives helped create cohesive dedication. Lack of seed funding via other means mandated a donation-worthy nonprofit structure. Regular meetings ensured accountability, tracked progress, and enforced timelines. The group structure facilitated transglobal communication between Nepal and the United States. This was especially useful to attain clarity of vision and goals despite language and cultural differences.

BUDGET

Creation of a detailed budget, including operating costs, was necessary to project ultimate fiscal viability of NAS. The cost of manufacturing and services in Nepal and India is less than in the United States. For instance, neck immobilization collars, spinal immobilization boards, and splinting materials were procured locally at a fraction of the cost advertised by international manufacturers. Nepali software developers were recruited to create ambulance dispatch software and medical records programs, as we understand that local programming and engineering are easier to support in the long run.

FUND-RAISING PLAN

An initial goal was set to obtain funds to cover the first 3 years of ambulance service. A detailed fund-raising plan was based primarily on community and donor support from within Nepal, rather than from international sources, with the understanding that this might not ultimately be sufficient. NAS fund-raising presentations educated potential donors on the importance of EMS, using a model of “corporate social responsibility.” Ultimately, monetary and in-kind contributions by individual board members made the program launch possible.

GOVERNMENT SUPPORT

For nations with centralized EMS systems, providing treatment regardless of ability to pay is most often subsidized by taxes. In Nepal, abolition of the monarchy in 2008 led to a disorganized period of transition toward a federal republic. As such, ambitious government initiatives were largely ignored. For NAS, the goal was to create a system that would prove worthy of government subsidy. Government support was sought early, predominately through meetings with the Ministry of Health and Population (MOHP) and other relevant agencies. Although a tax-based financial contribution was not feasible with the government and constitution in continuous flux, we kept key officials informed and continuously discussed possibilities.

Financial support was not the only objective. By proposing the endeavor and clarifying details early on, we hoped to avoid future political conflict. Persistent efforts were required to ensure transparency, maintain the blessing of the Nepali government, and avoid bureaucratic delays. MOHP leadership changed multiple times during development of NAS, making more difficult consistent support based on established personal relationships.

Transforming verbal governmental support into fiscal support is essential, particularly given our experience in India, where the Emergency Management and Research Institute (EMRI) effectively created an EMS system in 2005 that gained public popularity before formal governmental support. In EMRI’s case, government officials became believers after witnessing the positive impact of the nascent EMS system on morbidity and mortality. Today, the vast majority of EMRI’s funding is provided by the central and state governments. Months after NAS’s launch in April 2011, the Nepali Ministry of Home Affairs (MOHA) has begun discussions with NAS to explore potential collaboration.

CONFIRM APPROPRIATE PROVIDER AUTHORIZATION

For OOH care providers to be maximally effective, they should function within a larger healthcare system. Gaining the confidence of patients and the existing medical community required training and accreditation by local governing bodies. Before NAS, nonmilitary OOH providers, such as paramedics or EMTs, did not exist in Nepal. Given the delays imposed by Nepal’s political instability, the decision was made to proceed within existing regulations instead of attempting to adapt or change policy *a priori*. We therefore recruited the first NAS providers from a recognized provider group, namely, Community Medical Assistants. Most students selected for EMT training were previously or currently employed as phlebotomists, medical technicians, or nursing assistants.

SELECT TRAINEES AND OBTAIN RESOURCES FOR EDUCATION

We identified ambitious and talented individuals for the first class of EMTs. Most of the students had excelled in school, were proficient in the English language, and were already working in a healthcare field. Modest tuition was charged; however, employment with NAS was not guaranteed. NAS purposefully chose to train more providers than would be immediately necessary in anticipation of attrition.

OOH expertise, instructors, and curriculum development were critical components. Given that this expertise did not exist within Nepal, SEMI was tasked to design, prepare, and deliver the Essential OOH Care Course,

which consisted of written materials, on-site classroom presentations, and skills workshops. Nepali physicians assisted in the classroom during training and examinations. The cross-cultural nature increased local support for NAS within the medical community. NAS hired a medical director from Nepal to lead development of a quality improvement program, case review, and continuing education for employed graduates. Additional details regarding the initial training course and curriculum appear later in this article.

NAS conducted the education and training at Patan Hospital, which provided wireless Internet, a library, and classrooms. Equipment was purchased in Kathmandu or borrowed from the hospital.

CREATE A TIMELINE

It was important to create a timeline with accountability so that all participants could follow progress and identify delays. Schedules were updated as tasks were completed or interruptions encountered. Parallel tasking required timing solicitations and announcements to achieve the best effects. Tasks were managed with attention to cost effectiveness, communication at every level, and public relations.

Operations

COMMUNICATION

Before NAS, there was no 3-digit toll-free number in Nepal to call for medical assistance. An important milestone for NAS was obtaining permission to use 102 as its operating number. This accomplishment required many meetings over the course of 2 years with Nepal Telecom (NTC) and the Ministry of Information and Communications (MOIC).

Although EMS communication best practices prescribe the use of ultra-high frequency (UHF) radios, Nepal's MOIC restricts UHF access to police and military. Very high frequency (VHF) radio communication was considered too expensive and less effective. It was thus decided that cellular phones were the best and most cost-effective option. To use cell phones reliably, NAS opted to provide a level of redundancy by equipping each ambulance with a dual SIM card cellular phone capable of accessing both NTC and NCELL networks.

CALL CENTER

Incoming telephone calls to report emergencies are routed to a call center, where trained Emergency Medical Dispatch (EMD) officers staff "24 by 7." NAS worked with SEMI to develop telephone protocols for answering

calls, including directing layperson callers to perform Basic Life Support (BLS). EMDs learned to interact with NAS first responders on the radio to direct care and request additional resources, such as fire or police. Collaborating with these agencies to develop mutually acceptable operational protocols was important to ensure efficient communication and effective emergency response. To staff the dispatch center with trained communicators, persons were recruited from the "Essential OOH Care Course" conducted in Kathmandu. In this way, NAS was able to use human resources to maximize professional development and continue on-the-job training for graduates who sought to become OOH providers.

Although many EMS software programs already existed internationally, research by NAS found the least expensive acceptable program to cost \$500,000 U.S. The decision was made to build rather than buy. Developing a software program in Nepal offered many advantages, including access to technological support before and after service initiation. An Office for the Coordination of Humanitarian Affairs geographic information systems specialist in Nepal created and donated a detailed map of the Kathmandu Valley to ensure minimal ambulance response times.

FINANCIAL SUPPORT

Ideally, an EMS system, which is clearly a public good, is supported by government dollars. This was not to be the case initially in Nepal. Therefore, it was necessary to also raise funds. Fund-raising has primarily been focused on private donors and corporations with capacity for social responsibility. Mr. Om Rajbandary, an NAS board member and chief executive officer of a pioneer housing development company in Kathmandu, convinced his corporation to donate not only money but also office space, staff, and housing for visiting instructors. Many other businesses in Kathmandu donated services. NAS developed a marketing program to identify and recognize donors willing to pledge resources. The World Health Organization contributed funds, and it is hoped that as data demonstrate the positive impact of NAS on the health and well-being of the people of Nepal, there will be additional financial support. To what degree the government and private sector will support NAS remains to be seen.

Part of the fund-raising plan involved sponsorships with advertising rights for purchasing ambulances. This caused a significant dilemma for NAS when the taxes for purchased ambulances were not considered in the budget. Some of these donated ambulances were denied entry into the country by the government of Nepal, and NAS was forced to maintain good relationships with

donors while it petitioned for tax exemption. Unfortunately, this caused a significant delay in fund-raising, because NAS was understandably hesitant to continue soliciting pledges before delivering on expectations from similar agreements. Individual board members obtained personal loans to avoid a gap in service, but this is only a temporary solution. Fund-raising continues to be the most difficult issue facing NAS. It is an area of opportunity for nongovernmental organizations interested in having a significant impact on clinical care in an impoverished country.

PUBLICITY AND OUTREACH

Launching a very necessary public awareness campaign contributes to proper use of the system and public perception. To instill confidence, the service had to be running properly before the emergency telephone number “102” was advertised. In Kathmandu, there had been vehicles advertised as “ambulances” in the streets for years, but they were not used for EMS. NAS used the influence of its board members, and appointed Ranjit Acharya, CEO of the advertising company Prisma, to manage creation of a detailed campaign. He used his experience with designing “behavioral change communication” materials to produce a logo, public interest radio messages, posters, and brochures. Russ Pariseau, an American filmmaker and journalist living in Kathmandu, voluntarily created supportive photography and videos. He created a video of the new service in operation (http://www.youtube.com/watch?v=yOneSy7D_gc&feature=related).

HOSPITAL RELATIONSHIPS

Relationships with hospitals in Kathmandu were fundamental to success. It was important to formally define expectations before establishing NAS. As in many developing countries, private hospitals in Nepal often need to charge patients for services or risk fiscal demise. Similar to those in the United States, hospital bills can be very large and impossible for a patient to pay. For this reason, both patients and hospitals in Kathmandu hesitated to engage in treatment of emergency conditions without financial guarantees.

In the United States, federal law prohibits hospital emergency departments from turning away patients before an examination adequate to determine whether or not an emergency condition is present. In Nepal, no such law exists and hospitals are left to decide whether or not they are willing to treat patients. The situation that we obviously wished to avoid was bringing a patient in need by ambulance to a hospital, only to have care denied. Thus, it was essential that NAS investigate the willingness of hospitals in Kathmandu to participate fully in this new system by virtue of their agreement to

accept all ambulance-delivered patients, regardless of their ability to pay. We discussed specific scenarios openly and considered all options.

Physicians from SEMI helped to draft a memorandum of understanding between NAS and receiving hospitals. Culturally, this was perceived as extremely formal. Although financial discussions are never easy, hospital administrators saw NAS in a very positive light and, in fact, congruent with their hospital mission statements pledging to care for the underserved. Many of the hospitals in Kathmandu agreed to administer stabilizing medical care to patients transported by NAS to their emergency departments before entertaining any consideration for transfer to another facility.

Curriculum Development

NEEDS ASSESSMENT

Performance of a needs assessment was essential to curriculum design for the NAS OOH providers. The investigation we completed included evaluation of the level of emergency medical care available in hospitals as well as the OOH setting of Kathmandu. Briefly, the process included details of locally available infrastructure, personnel, equipment, and medical treatment. We applied formal review by personnel experienced in EMS and international emergency medicine development. By determining the level of current emergency care in Kathmandu, it was possible to target medical interventions with the most potential for being cost-effective and successful.

In Nepal, the emergency care available in most hospitals is rudimentary at best, and there is no post-graduate residency specialty training in emergency medicine. Nepal is typical of many countries in need of EMS support. Lack of standardized emergency care allows wide variation in the treatment of life-threatening conditions. Fortunately, there are a few dedicated physicians in Nepal who work outside of their trained specialty to improve their skills in emergency medicine. The shortfall of emergency medicine-trained doctors often leaves emergency treatment relegated to unsupervised residents or physicians lacking requisite decision-making and procedural skills. This background helped to tailor the level of skills best suited for the newly trained EMTs. In particular cases in India, for example, teaching sophisticated paramedic skills has created situations in which patients are reluctant to leave the ambulance for concern of receiving inferior care inside the hospital. Our solution included efforts to work within the medical community of Kathmandu to improve overall emergency care. To the best degree possible, there was sensitivity to not having the OOH providers exceed in a dramatic fashion the skill levels of the receiving physicians.

The chief objective in curriculum planning was to select skills that offer clear benefits to patients en route to hospitals in Kathmandu. Essential knowledge and skills were identified on the basis of their predicted influence on morbidity and mortality for Nepal. Advanced paramedic skills were mostly excluded from our initial training curriculum. This helps to avoid attrition of providers who might be recruited by nearby hospitals to take other jobs. However, we decided to include training in advanced obstetric skills for complicated childbirth, deemed appropriate given the situation in Nepal. In a country in which 63% of births occur at home,¹ it is suspected that delayed presentations of obstetric complications would require high-level skills of OOH providers. With Nepal's high burden of vehicular-related injuries, training in trauma care was emphasized.

ADOPTION OF EMT PLUS EMERGENCY FIRST RESPONDER DRIVER SYSTEM

Following the cost-effective model used by EMRI, NAS elected to staff its ambulances with 1 EMT and 1 emergency first responder (EFR) ambulance driver. Although the EFR scope of practice is more basic than that of the EMT, the drivers are essential to on-scene management and safe transportation.

Key Skills

IV CATHETER PLACEMENT AND FLUID RESUSCITATION

Fluid resuscitation is a basic emergency medical skill that improves outcomes in many situations, including dehydration and overwhelming infections, and allows administration of lifesaving medications. Although basic EMTs in the United States are not trained in the placement of IV catheters, we included this skill for OOH emergency care in Nepal. Students were taught fluid resuscitation for both pediatric and adult patients. IV catheter placement was perfected during workshops and clinical practice.

BASIC LIFE SUPPORT

BLS is especially important in cases of cardiac arrest, drowning, and pediatric emergencies. Trainees were taught to lead the resuscitation and direct bystanders to assist.

EMERGENCY CHILDBIRTH AND OBSTETRIC SKILLS

The level of expertise we included for OOH care providers in Nepal is equal to that of a paramedic in the United States. The curriculum included problematic

deliveries, prepartum and postpartum maternal care, neonatal resuscitation, and management of life-threatening complications.

TRAUMA MANAGEMENT

The "golden hour" of trauma is widely recognized throughout the international medical community as an opportunity to deliver lifesaving interventions. Trauma skills taught during the course included airway maneuvers, hemorrhage control, splinting, and wound care.

TRIAGE AND DISASTER RESPONSE

Nepal's current political environment, harsh geography, earthquake risk, and frequent flooding call for expertise in disaster management. Disaster response was learned via case studies and workshops. Students participated in disaster drills. Students were trained to serve as incident commanders and triage experts at the scene of a disaster.

LEADERSHIP

An OOH provider, whether arriving at the scene of a road traffic accident or entering into a family's home, must be able to command attention and direct care. In cultures, such as that of Nepal, that value passive nature and humility, a 1-week leadership skills curriculum proved essential in preparing confident, effective prehospital care providers.

MEDICAL MANAGEMENT

Emergency medical conditions can be treated appropriately by OOH providers if they have been taught to recognize and care for them. Among the topics covered in our course were diabetes, stroke, dehydration, respiratory distress, toxic exposures, infection, allergic reactions, heart attack, and body temperature alterations. Students were taught to use airway maneuvers, administer oxygen, check glucose levels, reverse low blood sugar, treat anaphylaxis, perform decontamination, give aspirin for suspected heart attack, and initiate nebulizers for asthma. Providers were taught how to take a pertinent history, perform a physical examination, and convey their findings to the receiving personnel at the hospital on arrival.

AMBULANCE OPERATIONS AND TRANSPORT

Ambulance operations include determination of overall scene safety. The trained OOH provider must be sure that the response team will not be put in danger. While on scene, they can address the potential for injury by noticing hazards, particularly concerning children or elders. Notably, untrained responders can aggravate

existing illness or inflict further injury to patients via improper moving and lifting. NAS OOH providers are experts in safe patient transport, and dutifully “first, do no harm.”

COMMUNICATION

The success with which emergency medical technicians provide lifesaving interventions may depend on the ability to communicate. As a call is initiated, they must be able to understand directions from the dispatcher. On arrival, they need to interview patients, and then describe the scene effectively, particularly if more resources are necessary. On arrival at the hospital, they must give a systematic report to caregivers receiving the patient to facilitate treatment and save time that could be critical to the patient's care. Responding EMTs document the details of each patient on the standardized NAS Personal Care Report (PCR). The receiving emergency department physician receives one copy, and NAS administrators retain the original for quality assurance, continuing education, and data management. Every interaction described above was discussed and practiced during the course to emphasize communication skills and anticipate likely scenarios.

Course Materials

SEMI faculty with experience in EMS training prepared the course materials. To accommodate the language barrier, course materials were intentionally concise. Local photographs and epidemiology were included whenever possible. Presentations were interactive to encourage participation as well as practice communication skills. Patan Hospital and NAS provided most equipment for workshops and training, which were supplemented with materials provided by SEMI.

Curriculum Design

Curriculum design was based on characteristics of the students and our experience as to how the subject matter would be best conveyed. Faculty was recruited for experience teaching EMS internationally and expertise in the subject matter. Novice instructors observed and drilled before lecturing.

We were also able to recruit Nepali physicians, who were present for all of the classes, and they provided help both with logistics and language translation. Their presence added great legitimacy to the program. These physicians helped clarify difficult topics “in the moment.”

We encountered difficulties with verbal and written communication (testing) because of our lack of Nepali language skills. Modification of the final examination

was made to administer the verbal case scenario-based portion in Nepali. The most significant shortcoming in the course design was failure to designate student “trainers” before beginning the course. We had initially planned to teach the course in a “train the trainer” model, but were unsuccessful in this, caused in part by difficulty identifying individuals who would be available and effective for this role.

Hospital rotations were arranged for students to spend time seeing patients, performing procedures, and working with the healthcare team. Each student rotated through obstetrics, pediatrics, surgery, orthopedics, and the emergency department. They were given specific chief complaints or injuries to direct their focus for performing history and physical exams. During this time, they practiced procedures and logged their progress.

Most newly certified EMTs in countries with existing professional EMS systems participate in an “internship” period aboard ambulances under the tutelage of veteran EMTs or paramedics. Because NAS did not have this option, they conducted full-scale simulations using patient-actors in *moulage* throughout Kathmandu to test the EMS system holistically. In addition to assessing the respective skills of EMTs, EFR drivers, and EMDs, these simulations emphasized an integrated, team-based approach and highlighted challenging operational realities, such as dense traffic (the norm in Kathmandu).

Current Update

NAS inaugurated its EMS system on April 14, 2011. The components of the system currently are as follows:

EMS STAFF

NAS employs 15 EMTs, 15 EFR drivers, 6 EMDs, and 2 administrators (CEO and CFO).

DISPATCH CENTER AND EMDs

The NAS Emergency Medical Services Dispatch Center is located in the RK Complex at Sitapaila Chowk, which is the same location for the NAS administrative headquarters. Two EMDs staff the 102 hotline around the clock. They manage each call in accordance with prescribed protocols and track the status of every active ambulance response to ensure effective coordination. In addition, the NAS Dispatch Software stores all patient information for comprehensive recordkeeping and quality assurance.

NAS AMBULANCES

NAS owns 5 ambulances, designed and delivered by Force Automotive Manufacturing of India. These ambulances are

the same model as those used at EMRI and are designed with sufficient space for EMS equipment and EMT operations. Ambulances are outfitted with BLS equipment and medications in accordance with NAS medical direction. Because of the previously discussed tax-exemption impediments, only 2 ambulances were operational at the time of inauguration. All 5 ambulances are in service as of spring 2012. Nepal Police (NP) generously agreed to allow NAS ambulances to stage within police stations, which provide security as well as water and lavatory facilities to the EMTs. These staging stations were strategically selected to reduce response times.

NETWORK AMBULANCES

In the event that NAS ambulances are unavailable or too far away to respond to a 102 call, 11 community organization-operated ambulances are available to respond to medical emergencies. Although these ambulances lack equipment and trained personnel meeting NAS standards, they ensure that NAS is able to dispatch an ambulance to each emergency 102 call.

AMBULANCE FEES

NAS provides service to the public regardless of ability to pay. In accordance with MOHP directive, NAS provides at least 10% of ambulances free-of-charge and charges the patient-party 20 Nepali rupees/km (one-way) plus the cost of medications and disposable medical equipment, which usually totals about 300 to 400 rupees, or approximately \$4 to \$5 US.

MEDICAL DIRECTION

To standardize the EMT scope of practice and provide the highest quality of care to emergency patients in a protocol-based format, NAS developed "NAS EMT On-Ambulance Standard Operating Procedures (SOPs)." In addition to adhering to the SOPs during each ambulance response, NAS EMTs contact on-line NAS medical direction provided by volunteer on-call local physicians. For quality assurance, in addition to monitoring completed PCRs, NAS conducts continuing EMT education through monthly review sessions and PCR case studies.

MOBILIZING COMMUNITY SUPPORT

NAS has gradually been able to garner financial support from the community. It has more than 150 individual patron members who have committed to contribute monthly 1000 rupees (\$15 US) and 25 corporate members contributing monthly 5000 rupees (\$65 US) per month, each monthly and for 5 years. NAS has signed a

memorandum of understanding with the Nepal District of Rotary International, intended to bolster monetary contributions.

EPIDEMIOLOGY

Through December 2013, the NAS Call Center has received 9346 calls (mean calls per day, 9) warranting ambulance response, for which dispatchers were able to send NAS ambulances to 8796 (94%) and network ambulances to the remainder. The average ambulance response time was 26 minutes from the start of the call (via toll-free 102) until NAS ambulance arrival on scene. Ninety percent of these emergencies were medical or surgical in origin, and 10% were trauma related. NAS EMTs assisted 21 births that occurred in the ambulances while en route to a hospital.

Commentary

Out-of-hospital emergency care, known as EMS in the United States, is a deliberate method of providing urgent and emergency medical care to large populations. If the premise is accepted that there will always be failures of prevention and primary care that lead persons to seek medical care for acute problems, and that prompt, cost-effective, and compassionate OOH emergency medical care is a good thing, then there is an enormous opportunity to provide existing expertise to nations that seek assistance. This specific example of white coat diplomacy is having the US medical profession reach out to nations in need to build and support sustainable OOH emergency medical care systems. These systems are vital in the provision of daily medical issues, and may be invaluable during times of mass-casualty crises. Furthermore, they are a window into the community for health education, identification of emerging health threats, and overall good will. We believe that the example set in Nepal can be extrapolated to many other nations, and look forward to future opportunities to assist countries for which white coat diplomacy is a welcome service. These may often be places where we have first formed an affinity for matters concerning the wilderness, but for which an obvious opportunity for improvement resides in the urban settings that support healthcare development and progress.

Reference

1. Population Division, Ministry of Health and Population (Nepal), New ERA, ICF International Inc. *Nepal Demographic and Health Survey 2011*. Kathmandu, Nepal: Ministry of Health and Population, New ERA, and ICF International, Calverton, MD; 2012.