NORTH AMERICAN PERSPECTIVES

PAHS: a Nepali project with international implications

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Abstract

Purpose – The purpose of this paper is to describe the Patan Academy of Health Sciences (PAHS), an initiative for rural medical education in Nepal, and show its implications for rural medical education in other contexts.

Design/methodology/approach – The paper employs a methodology from the field of design to identify solution requirements based on an understanding of the operational context and evaluates how the initiative meets these requirements.

Findings – The PAHS model meets the extremely challenging requirements of the Nepali context for rural medical education by providing a model of education that is closely integrated with rural communities and working to develop leaders in community health. It faces important future challenges in obtaining sustainable funding and implementation of tele-health.

Practical implications – On several levels, the project offers potential lessons for similar initiatives in North America: community health leadership; early and sustained community engagement; a pre-medical course to bring students to a common standard; and role modeling by faculty. The approach will be of interest to those responsible for rural medical education in the developed and developing worlds.

Originality/value – The paper shows how the local context in rural medical education can be understood by evaluating desirability for users, viability and feasibility.

Keywords Clinical medicine, Education, Rural areas, Nepal

Paper type Viewpoint

Few healthcare systems face challenges as severe as those to be found in rural Nepal. With huge logistical, economic and educational barriers, Nepal can be seen as a bellwether for initiatives in rural medicine: with apologies to Frank Sinatra, if they can make it there, they’ll make it anywhere.

In this challenging environment, a group of Nepali physicians and medical educators has embarked on a unique initiative to educate physicians to serve rural areas. In doing so, they hope to provide sustainable, long-term solutions to challenges that will be familiar to medical educators in both the developed and developing worlds.

Many of the lessons learned from this project will be transferable to other contexts such as rural North America. The curriculum was developed in close consultation with rural communities; students will be recruited from rural areas and will return there in the course of their studies to implement projects in community health. The ultimate
goal is to train Nepali physicians who will not only treat diseases but also become leaders in rural community health.

Our motivation for getting involved in this project was both professional and personal. On a personal level, we had developed a close affinity with the country and its people through past visits as tourists. On a professional level, the project offered each of us an opportunity to team up with an international board of eminent medical educators on a project that had the potential to change lives in one of the poorest countries in the world. Both the University of British Columbia (UBC) and the University of Toronto (U of T) supported our professional engagement within the context of a global project. UBC emphasizes internationalization in its TREK 2010 document: “The basis of UBC’s strategy is to develop more advanced international cooperation focusing on sustainable partnerships” (see www.trek2000.ubc.ca/), and as such promotes faculty endeavors that engage social responsibility at home and abroad. The Governing Council of U of T is similarly committed to such partnerships in its International Cooperation Policy (see www.governingcouncil.utoronto.ca/policies/intcoop.htm).

Timing also played a part in the development of this project. The recent emergence of Nepal from a decade-long civil war provided a unique and timely window of opportunity with new hope that initiatives of this type can be successful.

In this paper, we describe this Nepal initiative and comment on the broader lessons that will be learned from it. We begin by outlining the barriers to health care delivery in the context of rural Nepal. We describe the thinking behind the initiative and discuss what may be learned from it that could have applications in North America.

Barriers to health care delivery in rural Nepal
Nepal ranks 144th out of 177 countries on the UN Human Development Index (HDI) (UN Human Development Report, 2007-2008), which combines normalized measures of literacy, education, life expectancy, and GDP per capita. Nepal is the lowest ranked country on the Indian subcontinent and closer to sub-Saharan nations than to its South Asian neighbors (Table I).

Nepal is the poorest country in Asia, with a gross domestic product (GDP) per capita of roughly $1,000 (CIA Factbook, 2007). It has a stagnant economy and few accessible natural resources, limited infrastructure for communication or transportation, low

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<tr>
<th>Rank</th>
<th>Country</th>
<th>Human Development Index (2005 data, published 2007)</th>
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<tbody>
<tr>
<td>128</td>
<td>India</td>
<td>0.619</td>
</tr>
<tr>
<td>132</td>
<td>Myanmar</td>
<td>0.583</td>
</tr>
<tr>
<td>133</td>
<td>Bhutan</td>
<td>0.579</td>
</tr>
<tr>
<td>140</td>
<td>Bangladesh</td>
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</tr>
<tr>
<td>142</td>
<td>Nepal</td>
<td>0.534</td>
</tr>
<tr>
<td>147</td>
<td>Sudan</td>
<td>0.526</td>
</tr>
<tr>
<td>148</td>
<td>Kenya</td>
<td>0.521</td>
</tr>
</tbody>
</table>

Source: UN Human Development Report, 2007
levels of literacy and health education, persistent shortages of the basics of life and, until recently, armed conflict.

The low HDI and GDP standings of the Nepal speak of its difficult living conditions and have dire implications for the delivery of health care. Life expectancy at birth is 61 years. About half of all children under five are malnourished and infant mortality is 56 per 1,000 births (UN Human Development Report, 2007-2008). Remarkably, these figures represent significant improvements over time, and are a testament to the dedicated work of both the Nepali authorities and international organizations.

Over 85 per cent of the Nepalese population lives in rural areas, the poorest areas being in the mid-West and far Western regions. The distribution of physicians in Nepal is hardly equitable. In the Kathmandu Valley, for example, a physician’s average patient load is about 1,200, while in the mountainous regions the patient load can be over 30,000 per physician (see Table II). In remote districts the ratio is 1:150,000 (Journal Kathmandu Medical College, 1999; cited in Woollard, 2005). In addition, Nepal’s rural areas are distributed across some of the most difficult terrain in the world.

The specific challenges faced by health care practitioners in rural Nepal include the following:

- **Rugged terrain** – Nepal contains eight of the world’s ten highest peaks, and the entire country, with the exception of the Terai in the South, is mountainous. This, combined with poor and ever shifting infrastructure (due to annual mud slides, flooding and avalanches), makes travel difficult and often dangerous. Health care practitioners find it immensely difficult to serve multiple communities at a time.

- **Poverty** – As a result of extreme poverty, few resources are available for health care from either the private or public sector. Thirty per cent of the population lives below the poverty line, a figure that rises to 45 per cent in the mid-Western region and 41 per cent in the far Western region (International Fund for Agricultural Development, 2008).

- **Low education** – More than half of adults aged 15 or older are illiterate. Health education levels are low and many in the rural population are unaware of the basics of good nutrition, sanitation and disease control. Shamanistic beliefs and home remedies often take the place of medical knowledge.

- **Poor nutrition** – Only 16 per cent of Nepal’s land is arable, and most of this is in the lower altitudes of the Southern plains, a region that is becoming overtaxed due to internal migration. At high altitudes, few crops grow and the diet is

<table>
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<tr>
<th>Ecological zone</th>
<th>Total physicians</th>
<th>Total population</th>
<th>Population per physician</th>
</tr>
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<tbody>
<tr>
<td>Mountain</td>
<td>59</td>
<td>1,829,649</td>
<td>31,011</td>
</tr>
<tr>
<td>Hill</td>
<td>431</td>
<td>9,418,305</td>
<td>21,852</td>
</tr>
<tr>
<td>Kathmandu Valley</td>
<td>1,206</td>
<td>1,604,363</td>
<td>1,330</td>
</tr>
<tr>
<td>Southern Plain (Terai)</td>
<td>1,056</td>
<td>11,955,578</td>
<td>11,322</td>
</tr>
<tr>
<td>National</td>
<td>2,752</td>
<td>24,811,912</td>
<td>9,016</td>
</tr>
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**Table II.** Regional population and physician distribution

**Source:** Woollard (2005)
severely limited. A total of 17 per cent of the total population is undernourished, 48 per cent of children under five are underweight and 57 per cent are under-height (UN Human Development Report, 2007-2008).

- **Poor sanitation** – While some progress has been made in providing rural populations with improved water sources, utilization of improved sanitation remains low at 35 per cent.

- **Political instability** – Before a cease-fire in April 2006 and the subsequent election of a new government in 2008, Nepal was in the grip of a decade-long civil war. More than 14,000 were killed and about 600,000 displaced; in addition, more than two million people were believed to have fled to India. Violence devastated many rural areas and isolated remote regions.

- **Poor infrastructure** – Less than one-third of the rural population has access to an all-season road. There is just one rail line of 57 km in length, of which only 32 km is currently operational (World Bank, 2008a, b). Where electrical power is available, it is unreliable and power outages are frequent. Fuel shortages and rationing are also common, with periodic queues at petrol stations stretching several kilometers. Although telephone access has improved, it remains low at 17 main lines per 1,000 people; in the more urban centers only four people per 1,000 have access to the internet, and there is virtually no access in rural areas.

- **Inequality** – There are more than 50 ethnic and caste groups in Nepal, and discrimination is a significant issue. Disadvantaged groups include smallholder farmers, landless laborers, lower castes, indigenous peoples and women (International Fund for Agricultural Development, 2008). Caste-based discrimination is officially illegal but is in fact widespread, especially in rural areas. Members of the Dalit, or untouchable, caste work as low-wage laborers for higher-caste farmers. Girls have much higher infant mortality, and women’s economic prospects and education levels are lower than those of men.

In spite of these obstacles, rural Nepal has some mitigating circumstances: the recent election of a new government and the subsequent adoption of a new constitution have given Nepalis hope that the civil war has ended and a period of stability is about to begin. If this is indeed the case, businesses and funding agencies are expected to reconsider Nepal as an area for investment. Nepalis are, in addition, highly motivated to see living conditions in their country improve and prepared to invest immense energy and effort.

**Requirements of a solution**
Given the above barriers, developing solutions to Nepal’s deficit in rural health care is unquestionably a daunting task.

While some of these issues, such as poverty and political instability, are not controllable, a solution to this issue is more likely to be successful if it is desirable to rural users, viable from an economic and political perspective and feasible from logistical and technical points of view (Paradis and McGaw, 2007) The major considerations under each of these headings are outlined in the following.
User desirability

Partnership with communities. A successful solution must be designed in intimate consultation with rural communities rather than imposed from outside. Because each rural community is different, the solution needs to reflect the needs of individual communities through consultation and engagement of the community itself.

Homegrown. Like many developing countries, Nepal has seen many externally imposed initiatives fail because local providers either do not understand or take responsibility for them, or because they are based on a misunderstanding of local conditions. The poor communications infrastructure in rural Nepal exacerbates this problem by making communications with outsiders difficult. It is therefore essential that a solution be developed and implemented by Nepalis living in Nepal.

Rich understanding of users. Local habits and beliefs, such as religious beliefs, can play an important part in the adoption of initiatives in health care. Yet because they are infused in daily life, community members may not be able to describe them adequately or visualize alternatives to the current situation. Over time, a plan for developing health care in rural Nepal should therefore reflect an understanding of needs that users themselves may not be aware of.

Viability

Sustainability over the long term. While there are unquestionable short-term imperatives, a long-term solution to rural health problems in Nepal needs to emphasize preventive health measures as opposed to reactive treatments. Hence the solution needs to emphasize issues such as clean water, sanitation and health promotion.

Economic sustainability. A prerequisite for any program is the availability of stable funding over time, whether from private or public sources, or a combination of both. Given rural Nepal’s particularly challenging physical environment, measures that are relatively straightforward elsewhere, such as transportation of equipment or personnel, can be extremely resource-intensive; thus rural health initiatives need to be efficient from a logistical perspective.

Community education. With an acute shortage of medical personnel and challenging terrain, initiatives that foster preventive medicine, and basic treatments, in rural populations are likely to reduce the demand for services and allow caregivers to focus their attention on areas of acute need.

Consistent with Nepal’s political direction. After a brutal civil war and many decades of intense turmoil, a new government has been elected, the monarchy has been abolished and a new constitution is being drafted. The political situation, however, remains extremely unstable: there are still great social inequities, crippling shortages of basic commodities and continuing violence in some areas. While rural health care programs cannot be expected to solve these problems on their own, they need to contribute to the drive for a peaceful future in Nepal.

Feasibility

Overcome infrastructural shortcomings. While some level of infrastructure is necessary for the success of any rural initiative, effective rural health care programs in Nepal must not be too dependent on infrastructure. As noted earlier, Nepal’s road and rail
network is very deficient and, with frequent washouts and limited resources for maintenance, what does exist is unstable.

Simple technology. Limited communications networks and virtually non-existent internet in rural areas mean that health care programs must be technologically straightforward. In effect, this means that practitioners need to be capable of functioning independently with little external guidance. While some plans exist for developing tele-health initiatives in some communities, these are still in their infancy.

The Patan Academy of Health Sciences (PAHS)
The plan to develop the Patan Academy of Health Sciences was initiated in 2003, by a small group of Nepali physicians. The Academy’s overall objective is to educate physicians who will go beyond diagnosis and treatment of immediate complaints to design and manage health programs in rural communities — in short, who will become community health leaders. With the curriculum and faculty in place, the Academy is developing infrastructure to accept its first students in 2009.

PAHS stands out amongst a host of privately funded/for-profit medical schools, as well as three government medical colleges in Nepal, for three reasons:

(1) recruitment strategy;
(2) community involvement; and
(3) its choice of teaching hospital.

An overview of the PAHS model is given in Figure 1.

Recruitment strategy
PAHS will recruit a proportion of its students as trained paramedics. The paramedic training program in Nepal trains students with an interest in health care, directly from

![Figure 1. The PAHS model](image-url)
Community involvement
All students will be paired with a rural community for the duration of their medical program. As they proceed through the six years they will propose, develop and implement a community health project with that community. This intense and focused interaction will allow a two-way exchange. Students will gain understanding about health issues relevant to the community and will be in the position to provide health education, prevention strategies and eventually clinical skills to the community. Learning medicine in a community context has been demonstrated to increase the likelihood of students later choosing to work in a rural community setting (*Canadian Journal of Rural Medicine*, 1997).

Teaching hospital
PAHS has selected Patan Hospital, with a long history of serving the poor and disadvantaged within the Kathmandu valley, as its teaching hospital. This affords the opportunity for strong role modeling of students by doctors working in the hospital.

In no sense is PAHS a panacea for Nepal’s severe health care problems. The ultimate solution will come from a combination of initiatives by the public and private sectors. PAHS’s greatest strengths are its close connection with rural communities and its focus on preventive health; it is nevertheless dependent on external sources of funding and needs to develop a stable economic model. Table III summarizes how PAHS meets most of the requirements for user desirability, viability and feasibility given in the preceding section.

Parallels with North America
At first glance, there would seem to be few parallels between Nepal and North America. Looking deeper, however, and if one directs one’s gaze at rural pockets of either Canada or the USA, one finds some of the same health care challenges that face Nepal: rugged terrain, poverty, illiteracy, poor sanitation.

While the enormously rugged terrain in Nepal is in a class of its own, in terms of isolating communities from mainstream health services, parts of Northern Canada are only serviced by small aircraft, and only during limited times of the year on account of treacherous weather conditions. In the USA, one only needs to peruse the headlines during hurricane season to realize that natural disasters are capable of isolating already poor and underserved communities, thus escalating health care needs to epic proportions.

Like Nepal, some parts of North America suffer from low rates of literacy. Many small rural communities in both Canada and the USA have literacy rates below the
international average of 20 percent. As one example among many, according to the International Adult Literacy Survey (IALS), over 40 percent of New Brunswick adults score below the minimally acceptable score of 3, which corresponds to the ability to reliably read and write simple sentences in a single language (Brink, 2006). Lack of literacy complicates medical self-care processes by making reading prescriptions or adhering to complicated medical regimes difficult.

There is poor or limited nutrition in many remote far Northern communities in North America due to a complex set of causes, including limited access to healthy food choices, high prices, and limited education about nutrition. Climate change and global warming are shifting the availability of arable lands. Lands in the USA and Canada that were once the “bread basket” are now diminished as a result of unprecedented droughts or flooding, raising the cost of food and thus putting a nutritional strain on the poor (Fischer et al., 2001).

### Table III. Desirability, viability and feasibility of PAHS

| User desirability | Partnership with communities | The PAHS plan and curriculum were developed in close consultation with rural communities 
PAHS was initiated and is led by a Nepali team with international advisors |
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<td></td>
<td>Homegrown</td>
<td>Through constant contact and consultation with communities, the team has developed an intimate understanding of rural conditions. Ongoing research within these communities will continue to reveal unmet needs and opportunities</td>
</tr>
<tr>
<td>Rich understanding of users</td>
<td>Long-term sustainability</td>
<td>PAHS graduates will become community health leaders, working in rural communities to develop preventive health initiatives that improve health across the board</td>
</tr>
<tr>
<td>Economic sustainability</td>
<td>PAHS will focus on developing self-reliance in rural communities through health education of the community by its graduates</td>
<td></td>
</tr>
<tr>
<td>Community education</td>
<td>Sustained peace in Nepal requires economic development; economic development and health care go hand in hand. Both are priorities for the Nepal government. PAHS was established by Act of Parliament in 2007</td>
<td></td>
</tr>
<tr>
<td>Consistent with Nepal’s political direction</td>
<td>The development of preventive health initiatives is ultimately a low-cost solution to Nepal’s desperate problems in rural health. Nevertheless, the academy is presently dependent on external funding and stable funding sources will need to be found</td>
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<tr>
<th>Feasibility</th>
<th>Overcome infrastructural shortcomings</th>
<th>The placement of doctors in rural areas limits the amount of travel needed; however, there will still be some travel needed, especially in the early years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple technology</td>
<td>PAHS is not dependent on sophisticated technology; however, the emergence of tele-health in Nepal would enhance its efforts</td>
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**Note:** ♦Pushpa Kumal Dahal (Prachanda), Prime Minister of Nepal, conversation with the PAHS International Advisory Board, October 2008

PAHS: a Nepali project
Conditions on First Nations reserves in Canada and the USA lack adequate sanitation, and have poor water quality, with many people having to boil tap water for drinking. Low levels of literacy in Aboriginal communities, combined with shamanistic beliefs, are often at odds with adherence to a Western medicine model.

These challenges in North America exist alongside a similar imbalance between urban and rural distribution of health services. In rural Canada the doctor/patient ratio is 1:1,201 as compared to the ratio of 1:981 for Canada as a whole (Rourke, 2005). Few freshly trained doctors are starting their careers in remote communities, preferring to practice in urban multi-doctor clinics, with reduced call schedules in spite of increasing financial incentives levied by smaller towns (Kazanjian et al., 1991). There is also a shift away from family practice to higher-paying medical specialties, most of which require long residencies in close proximity to urban tertiary care institutions (Rourke, 2005).

On many levels, therefore, there are parallels between the situation in Nepal and that in North America. While there remain many barriers to overcome, the PAHS project, if successful, could offer an important two-way conduit of learning between Nepal and North America. A summary of the major areas of learning follows.

**Community health leadership**

Central to the PAHS project is the idea that competent doctors alone will not solve rural health problems. PAHS students will be trained to become leaders in community health, offering consultation on health education, preventive medicine, clean water and sanitation. To do so, PAHS graduates need to have both the knowledge of medical professionals and the social status (being qualified doctors) to engage with community elders.

**Early and sustained community engagement**

The PAHS project has made a concerted effort to bring the voices of the community to the table, in terms of planning for and engaging with the communities that the school hopes to serve. This has translated to having members of the community attend and speak at the PAHS consultative meetings, community engagement with regard to organization of community placement of students from the program and community consultation with regard to the ultimate location for the eventual Patan Academy campus (the land was donated to the school by the community). Lessons learned from the relationship established by the UBC Faculty of Medicine and the First Nations communities in the province of British Columbia have been useful in understanding the challenges faced in Nepal when developing successful rural community engagement. Lessons such as the need to work collaboratively with Aboriginal communities, acknowledging the cultural diversity and belief systems of Aboriginal peoples, and valuing and respecting the traditional knowledge and practices of Aboriginal people.

**Six-month pre-medical course to level the playing field**

In an effort to promote rural and remote suitability of the student body, for eventual practice in the rural communities, targeted recruitment strategies will favor rural students for admission to PAHS. This strategy has been employed in North America and elsewhere (Bates et al., 2005; Rourke, 2005; Laven et al., 2003), but what is unique at
PAHS and may provide guidance in North America is the pre-medical course that will accompany the PAHS medical curriculum.

In an effort to level the playing field for the mixture of urban and rural students, a six-month pre-medical course will have two equally important objectives. The first will be to provide pre-medical mathematics and science tutoring for the rural students whose academic preparation may be of a lower standard than the urban students. At the same time, the urban students will spend the six months being introduced to the reality of the rural community experience. Reciprocal learning will be facilitated by opportunities for urban students to help with mathematics and science learning and rural students to help with rural community orientation. In a sense neither group can fully succeed without the help of the other.

**Role modeling by faculty**

Careful attention has gone into selection of the faculty for PAHS and in particular the choice of teaching hospital. The Vice-Chancellor of PAHS, Dr Arjun Karki, is a living embodiment of his conviction, having left a lucrative career in the USA to return to Nepal with a goal to improve health care. Patan Hospital, the teaching hospital, has a long history of serving the poor and under-served communities in Nepal. Role modeling by doctors working at Patan hospital will underscore the school’s socially accountable mission.

**Conclusion**

The Patan Academy of Health Sciences in Nepal is an innovative approach to rural health care. With a curriculum that emphasizes rural health care, rural rotations and focus on community health, the PAHS project holds the promise of making a difference in extraordinarily difficult conditions. If successful, it could provide a model for rural medicine internationally and in North America.

**References**


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**About the authors**

Carol-Ann Courneya initially trained, and for many years practised, as a cardiovascular physiologist at the University of British Columbia. In 1998 her teaching and educational leadership were recognized with a National 3M Teaching Fellowship. Her research since 2000 has been in the area of medical education, specifically peer review and admissions/selection. Since 1999 she has been engaged in the practice of, and research in, international medical education. Carol-Ann Courneya is the corresponding author and can be contacted at: caotter@interchange.ubc.ca

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