

MINIREVIEW

Promoting Collaborations Between Biomedical Scholars in the U.S. and Sub-Saharan Africa

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The premise of this piece is that a priority of international health should be to increase the number of investigators in the US and other developed countries who engage in research and other kinds of scholarly work in underdeveloped parts of the world, particularly sub-Saharan Africa where the overall disease burden is the highest and the gap in biomedical research infrastructure is the widest. The author's aim is to encourage medical students, resident doctors, and medical school faculty to devote a part of their career to teach, acquire clinical skills, or participate in research with health professionals at teaching hospitals in Africa. After briefly describing the thinking that led the author to Nigeria 30 years ago to teach and study biochemical aspects of health problems in rural and urban areas, he discusses some of the factors one needs to consider before entering into an international partnership, including identifying the right foreign collaborators, selecting a suitable research site, setting realistic goals, learning the local culture and indigenous language, and defining a theme for your program. Lastly, the piece points out potential pitfalls and problems that are often overlooked or underestimated in the early phases of planning an international partnership, including lukewarm institutional support at home, inflexible institutional review boards, dominance of the program by the US partner, maintaining continuity, and striking the right balance between scholarly work and humanitarian efforts. My hope is that US students and faculty in the health professions who read this piece will be stimulated and encouraged to consider how they might integrate into their curriculum or academic life visits lasting several months or more each year during which they

would teach or train others or engage in research at a teaching hospital in some country in Africa. *Exp Biol Med* 233:277–285, 2008

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Background

Science today is supranational. In the past decade or so the biomedical sciences community worldwide has witnessed a marked increase in the number and scope of linkages between universities and health sciences centers in the US and other developed countries and teaching hospitals in developing countries, particularly those in sub-Saharan Africa, where the overall disease burden is certainly the highest in the world and the gap in biomedical research infrastructure is the widest. As pointed out by Marmot and associates (1), “The appallingly high rates of child mortality in sub-Saharan Africa are of the same order of magnitude as in cities in Victorian England. There is no longer one set of diseases for the US and another for Africa, but simply diseases, the occurrence of which varies within and between countries. To be motivated only by national research questions and to ignore the changing picture of global health would be to miss a vital instrumental opportunity.”

This trend has undoubtedly been stimulated in large measure by the widespread realization that in this global era, hardly any disease is the exclusive problem of one country or particular region of the world, and investments in health should be made with a global perspective (2,3). The human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) pandemic, the reemergence of malaria, emerging infectious agents, and the resurgence of multiple-

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and extensively drug-resistant tuberculosis, and the increasing incidence of chronic non-communicable diseases such as stroke and diabetes (4) are major driving forces behind the increase in international collaborations between countries for which the technology gap is great.

Interest in and commitment to international partnerships between teaching hospitals and universities in Africa and medical schools in the US did not spring up overnight; fortunately, there are many such linkages that have been functioning productively and continuously for decades and which provide excellent models and sources of information and expertise for anyone interested in developing their own international partnership. The Johns Hopkins School of Public Health and the University of California-San Francisco Health Sciences Center, for example, through their numerous and long-standing international partnerships, have made enormous contributions both to improving the health of populations in many countries, not just those in Africa, and to advancing the research capabilities of teaching hospitals in economically less-developed countries around the globe. Similarly, few universities could boast of a longer or more extensive and effective commitment to international programs and cooperation than Michigan State University. There are also many examples of individual physicians and scientists one could cite who have devoted an entire career to partnering with like-minded scholars in Africa or on other continents. One such internationalist that comes to mind is Dr. Richard S. Cooper at Loyola Stritch School of Medicine. Through his decades-long collaborations with physicians in many different countries, at the same time Dr. Cooper has been generating significant new knowledge about hypertension in Africans in particular, he has also been promoting medical education and helping develop infrastructure for biomedical research abroad.

Few would argue with the premise that among the resource-challenged nations of the world, those in sub-Saharan Africa are the farthest from the scientific mainstream in both a geographic and technologic sense (5). However, with the improved mobility and greatly enhanced means of rapid global communication that are possible between the US and Africa, and with the increasing numbers of scholars worldwide who are willing to devote part or all of their career to study, teach, acquire clinical training, or engage in research with their counterparts in Africa, the gap between the two worlds is beginning to narrow. To drive home this point, between 1984 and 2006 the percentage of US college and university students studying abroad increased from 6% to 20% (6). As the number of medical students wanting to gain clinical experience and do research in Africa and other developing countries is increasing, so too is the need growing for overseas sites where they can train and participate in international research. At the same time, there will be a need for senior biomedical scientists from the US and other

countries to travel abroad to mentor and supervise those students.

I was drawn to Africa by the civil war in Nigeria to which the history books refer to as the Biafran War. Within months of the end of hostilities the leaders of the Federal Government wisely decided to build a teaching hospital in Benin City near where the war had been waged. Ostensibly intended to train doctors, dentists, pharmacists, nurses, and other health professionals, I suspect the real reason the new hospital was built was to help heal the wounds of war and welcome the defeated back into the national fold.

At the time, as a soon-to-be tenured assistant professor at one of the most respected medical schools in the US, I began planning for a sabbatical leave. In 1975, an article in the *New York Times* reported that the new University of Benin Teaching Hospital was not only short of teachers but also wanting with regard to the basic science curriculum in biochemistry and nutrition. After receiving a positive promotion decision and with the support of my wife and two teenage sons, I applied for what was to be the first of my three sabbaticals to Nigeria. The head of my department turned down my request for a sabbatical leave, arguing that, "Africa will not help your academic career. It will jeopardize your NIH grants." I have since learned that it is not uncommon for medical school chairs, particularly those in the basic sciences, to place far more value on the overhead and salary monies NIH grants bring to the institution than on international programs that provide little in the way of overhead or salary support, but which afford incomparable experience and opportunities for research and teaching. Fortunately, the dean of the medical school countermanded my chair's decision and endorsed my request to spend my sabbatical in Africa.

The reason for choosing Nigeria was simple; I wanted to be useful. I also relished the challenge of teaching effectively and completing a research project in a country where I would have to learn about a new and unfamiliar environment and culture.

I have completed three sabbaticals in three different regions of Nigeria: the first one in the mid-1970s when the University of Benin Teaching Hospital in Benin City in the southern part of the country was just getting off the ground, and the other two at the Usmanu Danfodio University in Sokoto on the border of Niger and the Jos University Teaching Hospital on the Jos Plateau of central Nigeria. Furthermore, over the past 30 years I have mentored several hundred US undergraduates and medical students who conducted research projects in Nigeria and several other countries in Africa. I have also sponsored and coordinated a number of research, medical, and teaching missions involving scientists and physicians in the US and Nigeria. Through these endeavors I have learned to accept at face value the honorable motives US students and faculty express for leaving home to participate (often at consid-

erable financial expense and inconvenience, and sometimes even personal risk) in scholarly work in Africa.

I do not agree with the opinion expressed by Bezruchka (7) that “Most of the reasons (people) engage in international work sound humanitarian but are self-serving” or that all short-term overseas work in less technologically advanced countries necessarily qualifies as “medical tourism.” I prefer to take my own students and colleagues at their word when they express noble and generous motives for wanting to study and teach or do research in Africa. Most of them simply want to do something good, such as improving health. I agree with Roth (8) who believes that not all Western investigators in developing countries are necessarily cultural imperialists. Charitable interventions and biomedical research both have their place in international development strategies. “We are capable of conducting both in a manner that will aid our neighbors and, ultimately, help to reduce global inequities” (8).

No doubt there will be students who understand that the time they spend with me measuring the bone density of men and women using calcaneal ultrasound in the teaching hospital in Jos or collecting human milk from nomadic Fulani in a rural community 40 miles from town out in the bush can prove useful in their careers, particularly when they apply for residency programs or someday seek a faculty position. But questioning another's motivation is not a profitable way to spend one's time; instead, it is better to acknowledge that cross-national partnerships, if done properly, are usually beneficial to both parties and that motivation, as everyone knows, is inscrutable and just leave it at that. Better to judge people by what they try to do and what they accomplish.

Aims of This Piece

The priority in international health should be to encourage international partnerships to pursue biomedical research into the problems that are common in developing countries. Nicoll and colleagues (9) go even one step further: they believe the primary policy goal of international partnerships should be to eliminate poverty and encourage economic growth that benefits the poor. Noble though that goal certainly is, I am not sure it is a realistic one for most biomedical scientists in the US or one I am well-suited to undertake. Although alleviating poverty is unquestionably a worthwhile goal, faculty at US medical schools all have different and limited skill sets and can contribute in diverse ways that may be beneficial despite not having direct economic impacts.

International collaborations may take many different forms, including the sharing of unique data bases, correspondence by e-mail, exchanges of ideas at international conferences, and visits to foreign laboratories (5). The main aim of this piece is to encourage medical students, physicians, and clinical and basic science faculty in the biomedical sciences at medical schools in the US and other

countries blessed with advanced technology to become involved in scholarly work in Africa and to study the health problems that impact those populations. My second aim is to heighten the awareness of administrators of medical schools and health science centers in the US and other countries in North America or Europe about the benefits their institution could derive from entering into linkages with teaching hospitals in Africa. In striving to meet these goals, I have drawn ideas from the biomedical literature, reflected on my own experiences abroad, and sought the advice of colleagues who have worked in Africa to arrive at a list of specific recommendations and advice that might encourage US students and health professionals to undertake scholarly work in Africa.

If pressed to define my target audience, I would say I am writing mainly for physicians and PhDs who are at a stage in their academic career where they might be thinking about making international work a part of their scholarly work, whether it be through research, teaching, or some other form of service. Based on the close relationships I have had teaching biochemistry and nutrition to thousands of undergraduates and medical students at four universities in the US and having mentored more than 200 of these students in Nigeria, Niger and Zimbabwe, I am comfortable asserting that the humanitarian impulse in the young is often sacrificed on the altar of scholarship. Given the need for more biomedical scientists, regardless of citizenship or place of residence, to see the global opportunities of their profession, it is important for us to show our students and newly hired assistant professors that they do not have to choose whether to do the work of science or the work of a humanitarian and that they can do both. Here are a few examples of how you can do both. When I and my colleagues several years ago completed a study of the incidence of various intestinal parasitic infections in a rural village in northern Nigeria, we used donations from benefactors in the US to treat those infections and then drilled a bore hole that is providing 3000 people in that community and the surrounding region with safe water. One more example of how one can pursue research questions in the field and still contribute to improving public health in ways unrelated to your research. Again, with donations from friends, family, colleagues, and houses of worship in the US, every year or two we build a schoolhouse in the communities where we do our studies. Providing clean water and education are effective ways of raising the overall public health of the populations; it does not compromise the ability of a subject in our studies to sign an informed consent agreement.

Following is a list of issues to consider and the potential pitfalls you should be thinking about when contemplating committing yourself to an international collaboration. The focus of this piece, the questions I address, and the opinions and advice I offer are based mainly on my own experiences at teaching hospitals and universities in West Africa,

Nigeria, and the Niger Republic in particular. The logical place to begin is by addressing the following questions.

How Do You Establish an International Research Partnership?

Identify the Right Partner(s). Certainly, the size of a nation's research effort and capability and a number of non-science issues – including geographic locale, and linguistic, cultural, political, and religious factors – will all weigh heavily in the decision of where and with whom you will establish your international program (5). However, nothing is more critical to the long-term success of an international scientific partnership than the partners themselves. In this regard, Mons and associates (3) argue that the three most important hallmarks of fruitful and enduring collaborations between scientists on different continents are 1) common intellectual challenges and interests, 2) complementary expertise and experience, and 3) “personal liking,” for which I prefer to substitute the words “trust and respect.”

As has been the case with my own collaborations in Nigeria, successful, long-term scholarly collaborations are most likely to develop after an initial positive contact between individuals in two countries, and the single most important factor ensuring the success of an international partnership being the enthusiasm and the persistence of both partners (9). You should decide early on if you are prepared to “sign up for the long haul.”

An issue that every international partnership will eventually have to deal with, especially those that are successful and productive, is that of continuity. Inevitably, the originators and partners in both countries will grow old or retire or move, thereby necessitating the infusion of new blood and the recruitment and development of new leaders who can take over the program. This is one of the reasons why it is important, especially in the early phases of the program, for an international collaboration to have a strong institutional identity as opposed to being seen as being identified with just one or two individuals, even if they were the seminal people who initially conceived, inspired, established, implemented, and sustained the program. An international program that is strongly identified with a charismatic figure is more likely to self-destruct with the death or retirement of that individual, as opposed to one that is identified more with an academic institution.

There are several ways in which an international health research partnership can be brought under the aegis of the institutional umbrella to sustain and extend the collaborative program beyond the lifetime of the initiating faculty. First, a senior administrator of the academic institution in the US (e.g., president, vice-president of the health sciences center, medical school dean) can sign a formal linkage agreement with their counterpart at the host site. Second, the US medical school can demonstrate buy-in to the program by providing significant seed money for the first two or three

years of the program and modest funds every year thereafter so long as the program exists. With time, as the international program bears fruit and as extramural funding is secured, the leveraging provided by the internal funds will have been justified many times over. Third, the administrators of the US institution in the international partnership can provide the faculty member who directs the program with administrative support whenever collaborators from the foreign site are planning to visit the US. This might involve providing housing, writing letters to the US embassy in support of individuals applying for visas or assisting foreign faculty in applying for travel grants (e.g., The US State Department's Visiting Fulbright Scholars' Program).

Decide What You Want to Study. Much of the human health research that goes on in Africa involves surveys, descriptive or observational studies, epidemiologic explorations, or community-based longitudinal analyses aimed at establishing baseline standards or health parameters. The main goal of such studies should be to provide a clearer understanding of the health problems and priorities of the population in the region (8). There is an important role for operationalized research, randomized community trials, and randomized research studies that address the functioning of health systems that could advance health care and health policy in resource-poor settings. The argument is increasingly voiced that the existing fund of biomedical knowledge is sufficiently large to ameliorate many of the health problems affecting people in all parts of the globe and that we need to find ways to apply this knowledge. It is important to keep in mind, too, that the US should neither be exporting research questions to Africa because they are easier to answer there, nor dictating the particular studies that will be undertaken. In the process of identifying research projects, it is important to engage the partners fully and promptly in discussions aimed at deciding what should be studied.

The list of problems that are timely targets for research collaborations between biomedical scientists in the US and sub-Saharan Africa is practically inexhaustible; following are some of them: 1) heart and blood-vessel disease, including stroke and hypertension, 2) respiratory illnesses such as bronchitis and asthma, 3) effects of stress on mental health (e.g., anxiety related to lack of education, unemployment, and underemployment), 4) women's health (e.g., osteoporosis), 5) maternal/child health (e.g., perinatal nutrition, anemia, eclampsia/preeclampsia, lactation), 6) epidemiologic studies aimed at prioritizing health problems, 7) sickle cell disease, 8) dental health (e.g., nutrition, microbial pathogens), 9) infectious diseases (e.g., HIV/AIDS, diarrhea, tuberculosis), 10) illnesses associated with aging, 11) diseases of the eye (e.g., onchocerciasis), 12) anthropologic aspects of public health (e.g., taboos), 13) substance abuse (alcohol, drugs), 14) sanitation and clean water, 15) sports medicine, and 16) analysis of the medicinal and nutritional properties of non-cultivated, indigenous edible plants.

Decide Whom You Want to Benefit from Your International Collaboration. It is important not to lose sight of the intended beneficiaries of your program. A balanced international program should benefit the partners in the host country by enhancing their educational program and advancing all aspects of their research training, including study design, technical and quantitative analytical capabilities, statistical analyses, and manuscript writing. The local population from whom subjects for research projects are drawn should also benefit from the international partnership. The knowledge derived from the research should be channeled back to the individual volunteers and to the larger community through the partners and public health officials in the host country. Ideally, local faculty and health care workers not directly associated with the international program should also benefit from their interactions with physicians and medical students from developed countries.

I know of international programs where the visiting researchers gather up blood and other biological materials along with anthropometric, demographic, and historical information from subjects in the host country and carry it back to the US, where they perform all the laboratory-based analyses, consolidate the data, subject the data to statistical analysis, and write the manuscripts. An African colleague once said, "Well-intentioned and generous collaborators from the rich countries should understand that when you are offered a meal, you do not take the dishes with you after eating the food."

Senior US investigators participating in the partnership benefit by having the opportunity to study problems they may not be able to investigate at home. Probably the major beneficiaries of an international program are the undergraduates, medical students, and resident doctors who get to spend time doing health-related research in a developing country. However, I do not agree with some who believe that significant "long-term benefits accrue from trainees' spending even a few weeks overseas or three weeks in Eritrea," (6) and I do agree with Bezruchka's view that short-term overseas work in technologically less advanced countries by health professionals from technologically advanced countries does constitute "medical tourism" (7). Having personally mentored several hundred US students in Nigeria, experience has taught me that students and trainees need to spend at least two to three months abroad if they are to complete their own research project or contribute significantly to some larger study. In fact, some US directors of international programs expect their students to spend at least nine months at the foreign site(s), not only because they find that productivity is usually positively correlated with the amount of time one is abroad, but also because students who remain abroad for a long period of time are more likely than a short-time student to return to that country or part of the world.

Concentrate Your Program Geographically and Thematically. In the beginning and perhaps even for the

long-term, it is wise for you to focus your international program on a site or sites in just one country. Most likely, you will have a special interest in, or affinity for, a particular part of the world or maybe even a particular country. It is not uncommon for a young and perhaps overly enthusiastic investigator to establish relations not only with more than one foreign institution, but even more problematically, with multiple sites in two or more countries. Be wary of spreading yourself and your resources too thin. Instead, you should identify a short list of individuals in that country with whom you are likely to share research interests. Seek out others who have worked in and are very familiar with the host country where you are considering establishing a scholarly linkage. Consult the literature to see what kinds of papers faculty at that foreign university or teaching hospital have published, and identify individuals whose interests are similar to yours and who have published the results of their research in peer-reviewed journals, preferably ones that command an international audience. Then correspond with a few of the short-listed potential collaborators and inquire about the possibility of visiting them with the intention of initiating a scholarly collaboration. Given the ubiquity of reliable e-mail communication in virtually every corner of the globe, it shouldn't take very long to identify a foreign site with good potential for a mutually beneficial collaboration.

It is also useful to identify a theme for your international program. It might be childhood malnutrition, sanitation and safe drinking water, infectious diseases (e.g., tuberculosis, HIV/AIDS) or geriatrics. In my own case, for three decades the central theme of my research has been biochemical and nutritional aspects of maternal/child health.

Limit Your Expectations and Establish Benchmarks. At the time of the first meeting, the expectations and proposed scope of the international program should be relatively modest and narrow. Do not plan on conducting any grand-scale study during that initial visit. It would be more useful for you to present a few seminars on your research, along with several lectures to medical students, resident doctors, or other health professionals. Lectures and seminars are an effective and efficient way of introducing yourself to the local community. Ask your hosts what they think the most important problems are and which ones they would most like to research. At the same time, you should inquire and learn about local health problems, the academic and research interests of your hosts, and the infrastructure, capabilities, and limitations at the foreign site. It is critical to objectively assess the collaborative readiness of the local biomedical scientists and the institution's senior administrators (10). Probe their motivation for wanting to establish a formal collaboration with you. Is their interest in research strong and sincere or are they more interested in US dollars? Fortunately, most of my collaborations in Africa have been with individuals who were strongly committed to research

and other scholarly activities and not simply in gaining a salary supplement. In those rare instances where my overseas collaborators saw our international partnership mainly as a means of increasing their income, the collaboration did not endure. Prior to returning home from the mutually agreed upon site of collaboration, you should lay out plans for specific future projects and think about funding sources that might be interested in supporting your international partnership.

As soon as your international program has been established and launched it is important for the directors on both sides of the partnership to outline a set of benchmarks against which success can be assessed on an annual basis. Quantifiable, objective indicators of progress and success include 1) numbers of publications in respected, peer-reviewed journals; 2) numbers of students, faculty and technical personnel who have participated directly in the program; 3) health promotion at the foreign site; 4) curriculum development; and 4) grant support.

Immerse Yourself in the Local Culture and Language(s). One of your long-term goals should be to learn to speak the relevant local or appropriate national language. For example, if you are working in the Republic of Niger or some other francophone country, you should strive for a reasonable degree of fluency in French and Hausa, both of which are spoken widely across the western Sahel of Africa. In fact, I see a need for research into the role that geographic, cultural, and political factors play in determining how international collaborations are decided upon. Perhaps biomedical scientists with a background in anthropology should be encouraged to undertake such studies.

International Partnerships Cost Money. Fortunately, the number of funds and foundations, charities and non-governmental organizations devoted to global health has increased markedly in recent years. Initially, especially if you lack publications or other documentation of your commitment to international health in a particular part of the world, you may have to look to your own institution for start-up funds. All it takes to get started is a round-trip airplane ticket. However, as invaluable as institutional funding may be, especially in the initial phase, if your program is to grow and prosper for many years you will need to secure funding either from 1) governments (e.g., the Global Fund to Fight AIDS, Tuberculosis, and Malaria, the Millennium Development Goals, the President's Emergency Plan for AIDS Relief, the Fogarty International Center of the US National Institutes of Health, the Division of International Programs of the National Science Foundation); 2) individual philanthropic groups (e.g., the Bloomberg Foundation, the Bill and Melinda Gates Foundation, the Rockefeller Foundation, the Ford Foundation); or 3) international agencies such as the World Health Organization and UNICEF. It is important for your program to be

bidirectional. You should look for ways to bring faculty from the host country to your institution.

Anticipating Potential Problems

Even if you are successful in lining up all the individuals and resources you will need for your international program, and even if you and your partners are extremely motivated, conscientious, disciplined and hard-working, you will still likely encounter one of more of the following problems or pitfalls.

Dominance of the Scholarly Agenda by the US Partner. Mons and colleagues (3) refer to this phenomenon as the "post-colonial syndrome"—that is, the exploitation of the South by the North—and warn that "continuing dominance by Northern partners does not yield lasting partnerships. The time has come for equal South-North partnership, including healthy, two-way constructive criticism. A genuine partnership implies that African scientists have a balanced influence on setting the research agenda, even if the majority of the funds come from the North." Since power and control in human relations commonly correlate positively with money, striking and maintaining such a balance is usually not an easy thing to achieve: it requires transparency, honest and open communication between the North-South partners, and the establishment of clear and specific and mutually agreed upon goals, expectations and responsibilities. Periodic and frequent (i.e., annual) assessments of progress, accomplishments and problems at the foreign site, and discussions aimed at identifying future aims are useful ways to achieve and maintain a healthy balance between partners. Based on personal experience, the US investigators should strive to involve their African colleagues fully in all aspects of the design and execution of research projects, including statistical analyses of data through to writing manuscripts. The US collaborators should not only provide training and education at the foreign site; they should also aim to bring one or several of their overseas partners each year to the US site for brief periods of scholarly activity.

Human Ethics Committees. In the US such institutional research review committees in academic medical centers are usually known as the Human Research Review Committee (HRRC). Collaborative research between investigators in two countries invariably requires HRRC approval in both the sponsoring country and the host country. I know of few US medical-school faculty who have been engaged for years in international partnerships who have positive things to say about their own institutional human ethics review committee. The current process of gaining approval for human research in both developed countries and developing countries is becoming unmanageable. Gilman and Garcia (11) aptly expressed the frustration of many of us when they wrote, "Many members of institutional review boards (IRBs) in developed countries have little (if any) experience in the developing world and

do not understand local constraints.” Lacking such experience, the IRB often imposes unrealistic demands and restrictions on the research team. In one particular study of mine involving several dozen different ethnic groups in northern Nigeria (each with its own distinct language), one member of my institution’s IRB insisted I translate the two-page consent form into 35 different languages. On another occasion, the same committee could not understand why a Muslim man would insist that his own consent had to be granted before he would allow his pregnant wife to participate in a planned study of breast milk. Much time was wasted before the committee relented in each of these instances. Another wasteful requirement is for the US investigator to submit a myriad of redundant and duplicative forms from the Human Ethics Committee at the institution in the developing country. Nevertheless, it is imperative to adhere scrupulously to IRB rules, even those you regard as unreasonable. Moreover, ethical sensitivity should permeate all aspects of your international program. Three ways you can honor this principle are to ensure that 1) the research projects are inherently ethical, which primarily means that the questions they address should be important to the local community where the study will be conducted and that you are not simply exporting interesting questions to places where you can more easily study them; 2) the balance of risks and benefits are acceptable to everyone involved and meet reasonable standards that balance international norms and local needs; and 3) the informed consent process is meaningful with respect to the local norms and culture.

Setting Unrealistic Expectations. There is a tendency, invariably borne of good intentions, to promise too much. It is important to appreciate that every international program, including your own, will be subject to limitations in terms of both resources and technical capabilities. One sure way to lose the confidence and trust of your partners at the foreign site is to make promises that ultimately will never be fulfilled. The way to avoid this pitfall is to make a realistic assessment of your resources to be sure they are sufficient to achieve the specific goals you have set for your program.

Inadequate Communication and Limited Access to the Biomedical Literature. Although this remains a constant source of frustration for international scholars, it is much less a problem today than it was in 2000 when Horton wrote: “Small and poorly resourced libraries; erratic telephone, fax, e-mail, and postal services; and limited internet access all stifle contact with the North” (12).

Irresponsible Students: Alcohol and Drug Abuse, High-Risk Sexual Behavior, Cultural Insensitivity. If one of the aims of your international program is to provide undergraduates or medical students with a research experience in a developing country, then you need to be aware of the possibility that with every group of young people you send abroad, one or more will likely engage in some kind of irresponsible or risky behavior related to drug

or alcohol abuse, intercity travel on dangerous roads, unsafe sex, etc. Two ways of reducing the chance of such problems occurring are 1) to provide the student researchers with thorough and comprehensive pre-travel training about what is expected of them behavior-wise and what the risks are that they might encounter, and 2) to ensure that a senior faculty member who is well-versed in the culture and conditions at the foreign site accompanies the students and supervises them while they are abroad.

The Importance of Continuity. The issue of the program’s longevity was discussed above. If the senior administrators of an institution value their international program and want it to continue after they retire, then attention needs to be paid to the matter of succession. Younger scholars should be encouraged to take over the program, and they should be provided them with the various kinds of training and support they would need to succeed and advance along their career path. International partnerships are extremely fragile human constructs.

Lukewarm Institutional Support at Home. This is what I call the narrow-minded “Don’t we have enough problems here at home and shouldn’t we be taking care of our own?” complaint. Not all medical school deans appreciate that researchers, educators, and students — no matter where they study or work — are members of a worldwide scholarly community, and not all health sciences administrators see their public-service missions in global terms. A medical school dean I interviewed recently while working on this piece told me, “Our faculty shouldn’t be doing missionary work.” She argued that medical school researchers need not look beyond state or national borders for research projects, collaborators or ideas. “We should be taking care of our own, the citizens of our state,” she said. She saw no need to integrate a global perspective into the medical school’s master plan. “Our doctors should be taking care of patients and our basic scientists should be writing NIH grants.” Near the end of our discussion she admitted the real reason for her antipathy regarding international partnerships, especially those with countries in Africa and other developing parts of the world, had to do with economics: “Compared to a domestic NIH grant that pays 50% or more of a faculty member’s salary and brings with it 48% overhead, a typical international grant won’t pay more than 10% of the principal investigator’s salary or provide more than 8% of direct costs in overhead.” My point here is that if you are thinking of establishing an international partnership, be sure you have the support of your dean and chairperson; don’t get yourself into a situation where the international program you direct becomes an institutional orphan.

Finding the Right Balance Between Scholarly Work and Humanitarian Efforts. Scholarly work and humanitarianism are not mutually exclusive; the two can go hand in hand. Dr. Joseph Mamlin, a professor who leads an exchange program between Indiana University and Kenya’s

Moi University School of Medicine, contends that “To remain a purely academic program would (be) absurd” (13). Dr. Mamlin was referring to the large-scale farming component he and his staff have developed next to their HIV/AIDS clinic in rural eastern Kenya. They learned that antiviral drugs alone were not enough to restore health to their patients. The produce from the farm is given to patients who cannot afford to buy the food they need to get well.

You should expect that it will be difficult for you to limit your activities in a technologically poor country to research and teaching and not be drawn into humanitarian work. Any biomedical scientist who has spent considerable time immersed in research in a community in sub-Saharan Africa can tell you countless stories about the diverse kinds of assistance he or she was asked to provide. For example, during my most recent visit to Nigeria, I was asked to provide the following: a prosthesis for a young man who lost a leg in a motorcycle accident; three bundles of zinc to replace a roof blown away by a thunderstorm; a tooth extraction for my technician; burial costs for the father of the local chief; school fees for 7 of my driver’s 11 children; urea fertilizer for a communal maize and millet farm; medicine to de-worm three thousand people in the rural community where I have been doing my field work; calcium and vitamin D supplements for children with rickets; and plastic surgery to repair the cleft palate of a marasmic 6-month-old baby.

Larger problems may also arise. For example, several years ago, the settlement of Fulani cattle nomads where we had been conducting our research for many years was destroyed during religious/ethnic conflict, and many male heads of household were killed. Working closely with local-government officials who provided the land, we eventually helped those who were displaced by 1) relocating them in a secure area by building houses for the widows; 2) drilling bore holes to provide safe water; and 3) building schools for nomadic education that would serve both women and children.

Directing an International Program Is a Full-Time Job. Although you may spend only a month or two out of every year on the ground at the host site(s), directing an international program is a full-time job that will keep you busy year-round with multiple time-consuming tasks, including 1) corresponding with partners abroad; 2) purchasing and shipping supplies and equipment, and complying with customs regulations domestically and in the host country; 3) preparing personnel for working overseas, including organizing cultural orientation and HRRC training, arranging appropriate immunizations, and obtaining prophylactic drugs; 4) writing manuscripts, grant applications, and progress reports; 5) tracking and surveying past participants; 6) securing visas; and 7) transporting labile biological specimens across national borders. Chairpersons and deans need to appreciate the extra time and effort it takes — on top of the faculty member’s regular

teaching and research responsibilities — to apply for grants to sustain an international program and collaborations with foreign partners. Furthermore, promotion committees do not always place equal value on domestic and international grants and projects. Administrators can help by rewarding international work and reducing teaching duties and other responsibilities.

Beware of the Risk of Promoting the Migration of Talent from the Host Country (That Is, the “Brain Drain”). Faced with severe resource limitations at home, biomedical scientists in a resource-poor country often find themselves looking beyond their national borders for job opportunities. US directors of international programs ought to encourage expatriate African health professionals to participate in the program. Moreover, there are a variety of ways expatriate African physicians in the North America and Europe can contribute to infrastructure-building and the advancement of international health. Short of entering into a formal collaboration with a teaching hospital or individual biomedical scholar in their country of origin or elsewhere abroad, there are other ways in which expatriates can promote the advancement of medical education and biomedical research at the same teaching hospitals that educated and trained them. There are several ways this can be accomplished. First, they can establish e-mail linkages between themselves and colleagues at teaching hospitals back home, thereby providing a rapid and inexpensive means of transmitting data and scientific information back-and-forth and reducing the sense of isolation and abandonment that can be demoralizing to those who have stayed behind. Second, expatriates can provide their countrymen with up-to-date books, supplies, and equipment that would enhance the latter’s teaching and research capabilities. Third, funds permitting, expatriate scholars in the US can make important contributions to international biomedical partnerships by sponsoring mini-sabbaticals for their African counterparts. Fourth, expatriate medical school faculty in the US — be they clinicians or basic scientists — can make enormous contributions to the research productivity and quality of education and training at teaching hospitals in Africa by simply making annual visits of two to three weeks’ duration to those teaching hospitals and delivering lectures, seminars, courses, and workshops.

Concluding Remarks

Despite having encountered most, if not all, of these problems at one time or another, I can honestly state that tithing a fraction of my academic life to scholarly partnerships in Nigeria and other countries in sub-Saharan Africa for the past 30 years has enriched my life in general and my academic life in particular. On the last day of my Fulbright Fellowship in Jos, Nigeria I sat by the window of my bungalow watching a dozen camels laden with sacks of millet pass by in single file on the way to the grain market in town. Following behind them was a herd of 30 cows being

led to a nearby abattoir by two Fulani teenagers. I recognized the young nomads; they had come from the bush where several years ago my colleagues and I had built four schoolhouses for nomadic communities. Two thousand boys and girls are learning to read and write in those schools. Close by those schools are the boreholes we installed to provide safe, clean water for the settlements where many of the children and adults who have volunteered to serve as subjects in our various studies reside. A study we recently conducted under the auspices of our US-Nigeria Biomedical Scholars Exchange Program confirmed that the boreholes and the health education classes taught in the nomadic schools have reduced by a factor of ten the prevalence of water-born parasitic diseases that heretofore were the cause of diarrhea, slow growth rates in children, and devastating diseases such as schistosomiasis and hookworm. Contrary to the position of some HRRC members, I have discovered first-hand that research and humanitarian efforts, in combination with contributions from my Nigerian colleagues, can move forward in parallel and that "Western investigators in developing countries are not necessarily cultural imperialists" (8).

I have had the satisfaction of knowing that the manuscript-writing course I have taught to more than a hundred Nigerian scientists over the past 10 years has enriched their lives, greatly improved their writing skills, raised their level of self-sufficiency, and increased the number of papers they publish in international medical journals. The same individuals who collaborated in our international partnership co-authored many of those papers. At the same time, I am aware of how much my Nigerian colleagues have taught me and my students and colleagues about Africa in general and their own country in particular. They have taught us the history of the continent and informed us about its geography and politics, but mostly

they have educated us about the diverse cultures and health-related problems of the region where we have worked. All in all, I would say that our modest 30-year-old international partnership has been balanced to a very satisfying degree in terms of the benefits that have accrued to the participants on each side of the ocean.

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