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GLOBAL HEALTH AND ITS NEED FOR A RESEARCH UNIVERSITY

Global health has become an area of great interest in Academic Health Centers (AHCs) and Universities across the United States. An international learning experience is a common component of undergraduate education, and is now becoming very popular in health sciences schools. Students commonly visit other countries on their elective time; and students from other countries spend learning time in U.S. health professional schools. It is estimated that upwards of 25% of the health sciences students have an international educational experience during any given year. Although agreements commonly are in place between institutions, much of the exchange occurs within a more informal framework.

In some cases, a formal funded programme exists with an ever increasing occurrence. Some examples include:

1. University of Minnesota Medical School and the Karolinska Institute in Stockholm. A donor established an endowment that has permitted an informal relationship to become one of planned student and faculty exchanges, the matriculation of students in degree programmes, and common programmes and inter-institutional research in areas of common interest, e.g. emerging infections, stem cell biology, etc.
2. University of Minnesota Academic Health Center and the Catholic University at Leuven, Belgium established an inter-institutional agreement to develop an International Stem Cell Institute. This intercontinental relationship became possible when a senior professor from Catholic University, Leuven who was at the University of Minnesota, returned to Leuven after establishing the world's first Stem Cell Institute in Minnesota. Since then graduate student and faculty exchanges are occurring, along with the joint appointment of new faculty.
3. The School of Public Health Masters of Health Administration programme has made an application to the Minister of Education in Hong Kong to start a degree programme in the Spring of 2007. This effort was made when the alumni of the University programme who returned to Southeast Asia requested that such a programme be established in Hong Kong to meet the needs of the care delivery system in that region.
4. Relationships such as the one being established in India with the ICMR, is with the objectives to support research, and to partner in care delivery in areas of need, e.g. bone marrow transplantation. As a result collaborative research programmes

are being launched in areas such as the obesity and diabetes clinical trial in partnership with our Indian colleagues.

These cases are examples of the increasing trend for globalization in the health professions for their educational needs, and some of the specific needs that lead to these relationships. Clearly, this trend is reflecting a need that exists in the education of health professionals world-wide. The deliberations presented in this write-up will explore some of the reasons why such a transition is taking place, what the benefits of such relationships are thought to be, and some of the characteristics that such relationships need to have to be successful over the long-term.

Reasons That Such a Transition is Occurring

In the latter part of the twentieth century and into the twenty-first century, the economy of most countries became global. Major companies in the private sector, such as the IBM and Medtronic, recognized the opportunity for marketing products in other countries as a route to growth and profitability. Consolidation in some industries, such as the pharmaceutical industry, resulted in global companies where research and development of new products could happen on a global scale. For other industries, such as manufacturing, labour costs in other countries were cheaper than labour at home where the cost of benefits was making pricing increasingly non-competitive. In other industries, such as banking, credit, and health care, the need for twenty-four hour service necessitated service centers being located in other time zones, for the reading and reporting of diagnostic x-rays.

Clearly, the market potential in developing countries drove some of this world-wide activity. The increasing world population and availability of disposable income do create these opportunities. International travel has also become cheaper, easier, and more accessible, and tourism has become a major source of market development and economic support in countries world-wide. People from all countries are traveling all over the globe, and a very few into the space around it.

Over the last 20-30 years, the availability of information, whether news events, new science, or market data, has become instantly available over the world-wide web and satellite communications. Such

availability of information is resulting in the transformation to knowledge-based economies—banking and finance, and business development are two examples.

Such a transition to knowledge based economies has substantively increased the demand for a workforce with skill sets requiring higher levels of education and training. This demand is resulting in increased enrollment in higher education institutions, world-wide movement of students, and increasing competition for individuals with such skill sets. One apparent additional result of this phenomenon is that innovation is now occurring world-wide at an accelerated pace, further enabling the development of global relationships.

It is expected that these forces will continue putting greater pressure on global economic development.

The Interest of a Research Academic Health Center

The University of Minnesota Academic Health Center comprises the schools of Medicine, Nursing, Dentistry, Pharmacy, Public Health, and Veterinary Medicine; several Allied Health disciplines; 16 interdisciplinary programmes such as the Comprehensive Cancer Center, the Stem Cell Institute, the Center for Spirituality and Healing, the Center for Bioethics, and the Centers for Genomics and Proteomics. Over and above this, the clinical enterprise consists of professional practice plans, a paediatric hospital and adult hospitals and clinics. Approximately two thirds of the practicing health professionals in the State of Minnesota have received their education and training at the University. The research portfolio of the university of Minnesota AHC consists of approximately \$360,000,000 in sponsored projects, all health related and most funded by the National Institutes of Health. The AHC is also one of the major economic engines of the State of Minnesota, supporting the entire health industry, some of which is part of the global economy, e.g. Medtronic, Boston Scientific, Cermodics, etc.

Such a health center, together with a University of 65,000 students, attracts students world-wide, particularly into its graduate and professional programmes. This phenomena also acts as a magnet that keeps some students in Minnesota for their professional lives. Such diversity has been further

enhanced by the increasing immigration of people from India, Southeast Asia, the Middle East and Europe. Intercontinental travel has become the order of the day for students, also, for the faculty and the people of the State.

This mobility and multi culturism has resulted in the presence of new diseases locally, e.g. multi-resistant tuberculosis and intestinal parasites, as well as an awareness of the world-wide crisis in emerging infections and the presence of public health challenges, like malaria, influenza, AIDS, tuberculosis and other infectious diseases. The presence of new cultures creates a challenge in understanding the health needs of those communities, in addition to the health disparities that already exist in many areas of the State. These two challenges have enhanced the need for students at all levels to have an international education experience; and for faculty to spend time with their counterparts in other countries performing research on site to find new ways to prevent and treat disease. With part of the mission being service, partnering with other countries to improve health status is another driving force for new relationships in areas like AIDS in Africa, influenza in Southeast Asia, etc. Educating and training students from other countries who return to their countries is an important part of university health mission of Minnesota AHC and this provides the platform for more lasting and productive relationships.

It has also become clear that clinical trials are other areas of opportunity. Many countries are seeking the technology of quality clinical trials, producing their own technology to prevent or treat disease, and have large, readily available populations of people willing to participate in such trials, particularly in disease areas where large number of such volunteers do not exist in the States, e.g. malaria, tuberculosis, intestinal parasites. Quality clinical trials that satisfy the regulatory criteria of the local country and the Food and Drugs Administration are becoming increasingly possible.

One last, relatively recent, concept is important. Health used to be viewed as the result of a developing economy. What is now apparent from economic development efforts, is that the health of a community is an essential requirement for economic development to happen. A healthy workforce and local access to quality health care are essential success factors for

economic development to occur. Same is applicable for academic health centers, education, research and achieving health.

Forming Lasting Relationships

On perusing the files of affiliation agreements, one can assess that many existed, but only a few are active at any given time. If educational and research goals are to be achieved that result in health improvement, more lasting relationships need to be established so that each can become productive. Forming such relationships requires time and commitment. Slowly we are learning what the success factors are, and a few are being outlined here:

1. Such a relationship must be mission driven. For us, that is about the education and training of the next generation of health professionals and the discovery and dissemination of new knowledge that improves health. There must be a match of that mission, and the values that it encompasses, for a lasting relationship to occur.
2. Lasting relationships do not occur with written agreements alone. People are the key ingredient, namely faculty and students. In particular, faculty provide the lasting bridge when they form relationships with their peers around mutually agreed areas of research and education, or service projects.
3. Time needs to be spent forming and keeping the relationship in a setting where appropriate resources are provided for the programme to be developed. The role of administration is to provide a platform for the relationships to occur and continue, e.g. agreements, travel, resolution of business, financial and legal arrangements.
4. Projects that succeed are those that help solve local problems and are also in area of interest to the visiting faculty.
5. Degree programmes may be desirable. In such areas, one should assist their development and have a planned transition to local ownership clearly defining as to when and how.
6. A clear definition of roles and responsibilities is essential.
7. Periodic joint review of performance and a decision to continue or discontinue the relationship is essential.

- 8 Clear goals and performance criteria need to be present to keep the development of the programme on track and to provide accountability for the use of people and financial resources.
- 9 Mutual professional respect and adherence to local customs and bureaucracy is essential. Openness to coaching in these settings is of great importance.
10. Planning needs to occur prior to embarking on formalizing such a relationship, sometimes with a pilot effort, and with an analysis of the scope and needs of the effort. Both parties will need to participate in this effort. Defining the scope of an undertaking is a critical success factor. The mission benefit and value must always be the guiding factor for both parties.
11. Written agreements are a must as the relationship matures and the scope and goals become identified.

Conclusions

- 1 Globalization is a fact of life and will continue to develop.

- 2 Health is a key success factor for economic development.
- 3 Global health challenges affect us all.
- 4 Multiculturalism is the order of the day.
- 5 We need to find the win-wins in order to form successful relationships.
- 6 Successful relationships require commitment, resources and constant attention.
7. The best model is for lasting, productive relationships, perhaps with fewer locations world-wide.
- 8 Such relationships will be rewarding at multiple levels.

This write-up is based on the ICMR Foundation Day Oration delivered by Dr. Frank B. Cerra, Senior Vice President of Health Services, University of Minnesota, USA. The oration was delivered at the National Institute of Immunology, New Delhi on October 18, 2006.

ABSTRACTS

Some Research Projects Completed Recently

Hemicraniectomy with duroplasty for the treatment of acute ischemic stroke - A prospective randomized study

A prospective study was undertaken on 40 patients (33 male, 7 female) in the age group of 20 to 62 years with large hemispheric stroke to assess the efficacy of early decompressive surgery in large acute ischemic brain infarcts and compare it with conservative medical management.

It was observed that patients with decompressive craniectomy fared worse at discharge in terms of mortality. However, the functional status among the survivors measured using MRS or GOS was not significantly better following craniectomy in comparison with conservative treatment. Improvement in the severity of neurological deficit as measured by the NIH stroke score was significantly greater with craniectomy than in the conservative treatment group. Thus, this study demonstrated a higher mortality but possible better neurologic outcome among survivors.

The number of patients in each of the groups was small. The two groups differed significantly in the neurologic status at entry into the study as suggested by the significant differences in both NIH stroke score and Glasgow Coma Score at admission with the scores being worse in the craniectomy group. This may explain a part of the poorer outcome experienced by the latter group. Also, more number of patients receiving craniectomy required ventilation and had a long ICU stay.

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Study of different immunological factors across the clinical spectrum of filariasis in an endemic area.

Humoral immunity, T-cell proliferative response and cytokine levels against Bancroftian malayi microfilarial

antigens and circulating filarial antigen levels were determined in individuals representing all the groups across the clinical spectrum of filariasis in an endemic area. Circulating filarial antigen was detected in 95% of microfilaraemics, 60% of acute cases, 75% of different grades of chronic filarial cases, 100% of occult cases and none of the endemic normals. Against *B. malayi* microfilarial excretory-secretory (mf ES) antigen, microfilaraemics showed significantly elevated levels of IgG4 and IgG3 antibodies. While acute filarial cases had pronounced IgG1 antibodies, grade I chronic and occult filarial cases showed higher levels of IgG1 antibodies. IgE antibodies were found to be elevated in chronic filarial cases.

Against a 200 kDa *B. malayi* mf soluble antigen SF1 microfilaraemic individuals, however, had significantly higher IgG4 antibody levels than in the clinical filarial or endemic normal group. IgG3-antibody levels were high in clinical filarial group compared to endemic normal group. Both microfilaraemics and clinical filarial cases showed cellular immunological hypo responsiveness compared to endemic normal group against SF-1 antigen. A predominant Th-1 type immune response possibly involved in immune protection was noted in the asymptomatic and a microfilaraemic endemic normal group. Upon SF-1 antigen stimulation the PBMC of this group produced high amount of IFN- γ and less IL-4 cytokine. Asymptomatic microfilaraemic individuals on the other hand had pronounced Th-2 like immune response with

their PBMC yielding increased SF-1 antigen specific IL4: IFN- γ ratio. The clinical filarial group of patients did show lack of Th-1 type of immune response with significantly less antigen specific IFN- γ production, while their IL-4 yield was only marginally lower compared to that of microfilaraemic group but higher than in endemic normal group.

Immunomonitoring of filarial cases showed significant decrease in filarial specific IgG4 antibodies in all the three groups, viz, microfilaraemic, chronic and occult filarial cases after treatment with DEC. While there was no significant decrease in filarial IgG1 and IgG2 subtypes, filarial IgG3 antibodies increased significantly in chronic filarial cases followed by DEC treatment. Filarial specific IgE antibodies did not alter significantly in most of the groups except in occult filarial cases, who showed significant decrease followed by DEC therapy.

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Publications:

1. Bhunia, B., Bhandari, Y., Reddy, M.V.R. and Harinath, B.C. Analysis of IgG subclasses and IgE antibodies across the clinical spectrum of bancroftian filariasis in an endemic area. *Indian J Pathol Microbiol* 46: 113, 2003.

ICMR NEWS

Meetings of the following technical groups/committees of the Council were held:

Scientific Advisory Committees (SACs)

SAC of Vector Control Research Centre, Pondicherry	October 11-12, 2006
SAC of Centre for Research in Medical Entomology, Madurai	November 4-5, 2006
Combined SAC of Tuberculosis Research Centre, Chennai & National JALMA Institute for	November 6-7, 2006

Leprosy and other Mycobacterial Diseases, Agra

SAC of the Institute of Immunohaematology, Mumbai November 16, 2006

SAC of National Institute of Virology, Pune November 23-24, 2006

Project Review Committees (PRCs)/Task Forces (TFs)/Project Advisory Committees (PACs)/Project Advisory Groups (PAGs) and Other Meetings held at New Delhi

PRC on Cardiovascular Diseases October 6, 2006

Brain Storming Meeting on Childhood Obesity	October 9, 2006
Sub-committee on Review of Management Guidelines on Buccal Mucosa	October 30, 2006
PAC for the Project on Effect of Probiotics VSL 3 on Prevention of Sepsis in 0-2 Month Old Infants: A Randomized Controlled Trial	November 1, 2006
Expert Group on Stem Cell Research	November 7, 2006
PRC on Oral Health	November 8, 2006
PAG on Estimation of Oxidative Stress in Iron Deficiency Anaemia in Daily vs. Weekly Schedule among Pregnant Mothers	November 14, 2006
PRC on Pharmacology	November 14-15, 2006
PRC on Anatomy, Anthropology, Human Genetics, Haematology	November 21, 2006

Workshops/Symposia/Orations

The Council organized ICMR Foundation Day Oration on Global Health and Its Needs for a Research University, by Dr. Frank B. Cerra, Senior Vice President of Health Services, University of Minnesota, USA at the National Institute of Immunology, New Delhi on October 18, 2006.

An ICMR-WHO Collaborative Workshop on Pesticide Residues and their Risk Assessment was organized at the ICMR Headquarters, New Delhi during November 5-6, 2006.

The Council Organized a Symposium-cum-Training Programme for Developing Capacity Building of Young Scientists especially for North-East Region of the Country for carrying out Nutrition Research, at the Mahatma Gandhi Memorial Medical College, Indore during November 19-22, 2006.

Participation of ICMR Scientists in Scientific Events

Dr. C.P. Puri, Director, National Institute for Research in Reproductive Health (NIRRH), Mumbai, participated in the XXIV Annual Symposium on Nonhuman Primate Models for AIDS at Atlanta (October 4-7, 2006).

Prof. Arvind Pandey, Director, National Institute of Medical Statistics (NIMS), New Delhi, participated in the meeting of the International Obstetric Fistula Working Group Data Indicators and Research Group at Geneva (October 11-13, 2006).

Dr. Sukla Biswas, Assistant Director, National Institute of Malaria Research (NIMR), Delhi, participated in the XLIV Annual Meeting of the Infectious Diseases Society of America at Toronto (October 12-15, 2006).

Dr. D.T. Mourya, Deputy Director (Sr. Grade), National Institute of Virology (NIV), Pune, participated in the American Biological Safety Association Conference at Boston (October 14-20, 2006).

Dr. R.S. Paranjape, Director, National AIDS Research Institute (NARI), Pune, participated in the I Evidence for Action on HIV Treatment Consortium meeting at London (October 17-19, 2006).

Dr. V. Venkatesan, Assistant Director, National Institute of Nutrition (NIN), Hyderabad, participated in the Workshop on Programming Pancreatic Beta Cells at Barcelona (October 18-22, 2006).

Dr. Atanu Basu, Assistant Director, NIV, Pune, participated in the International Biannual Workshop on Diagnostic Electron Microscopy in Infectious Diseases at Berlin (October 19-20, 2006).

Dr. Hema Joshi, Assistant Director, NIMR, Delhi, participated in the Malaria Drug Resistance Workshop at Cambridge (October 19-22, 2006).

Dr. Vrinda B. Khole, Deputy Director, and Dr. Geeta R. Vanage, Assistant Director, NIRRH, Mumbai, participated in the Annual Meeting of the American Society for Reproductive Medicine at New Orleans (October 21-22, 2006).

Dr. A.N. Ghosh, Deputy Director, National Institute of Cholera & Enteric Diseases (NICED), Kolkata, participated in the Training on Application of

Environmental SEM Quanta 200 on Biological Samples at Endhoven (October 23-27, 2006).

Dr. Dipika Sur, Deputy Director and Dr. Byomkesh Manna, Assistant Director, NICEED, Kolkata, participated in the XV Annual Intestinal Flora Symposium at Tokyo (October 24-28, 2006).

Dr. K.V.R. Krishna, Assistant Director, NIN, Hyderabad, participated in the XXVIII Session of the Codex Committee on Nutrition and Foods for Special Dietary Uses at Chiang Mai (October 30 - November 3, 2006).

Dr. P.R. Narayanan, Director and Dr. Soumya Swaminathan, Deputy Director (Senior Grade), Tuberculosis Research Centre (TRC), Chennai, participated in the XXXVII Union World Conference on Lung Health at Paris (October 31 - November 4, 2006)

Dr. N. Selva Kumar, Deputy Director, TRC, Chennai, participated in the International Union Against Tuberculosis and Lung Diseases (IUATLD) Annual Conference and WHO Meeting on TB Laboratory Strengthening at Paris (November 1-7, 2006).

Dr. Soumya Swaminathan, TRC, Chennai and Dr. V.M. Katoch, Director, National JALMA Institute for Leprosy and Other Mycobacterial Diseases (NJIL&OMD), Agra, participated in the IBSA Tuberculosis Research Workshop at Stellenbosch (November 6-7, 2006).

Dr. K. D. Ramaiah, Assistant Director, Vector Control Research Centre, (VCRC), Pondicherry, participated in the International Workshop on Lymphatic Filariasis at Copenhagen (November 7-10, 2006).

Dr. Shyam Narayan, Research Officer, Rajendra Memorial Research Institute of Medical Sciences (RMRIMS), Patna, participated in the LV ASTMH Annual Meeting at Atlanta (November 12-16, 2006).

Drs. M.V. Murhekar and R. Ramakrishnan, Deputy Directors; Dr. Vidya Ramachandran, Assistant Director and Drs. P. Manickam and Prabhdeep Kaur, Research Officers, National Institute of Epidemiology, Chennai; and Dr. G.K. Medhi, Senior Research Officer, Regional Medical Research Centre (RMRC), Dibrugarh, participated in the IV TEPHINET Global Scientific Conference at Brasilia (November 12-17, 2006).

Dr. N.C. Hazarika, Deputy Director, RMRC, Dibrugarh, participated in the XV Annual Conference of the Faculty of Medical Sciences at Kingston (November 16, 2006).

Dr. A.C. Mishra, Director, NIV, Pune, participated in the VIII Meeting of the WHO Advisory Committee on Variola Virus Research at Geneva (November 16 - 17, 2006).

Dr. Runu Chakravarty, Assistant Director, ICMR Virus Unit, Kolkata, participated in the VI Workshop on HCC and Hepatitis in Asia at Tokyo (November 18-19, 2006).

Dr. K. Narain, Assistant Director, RMRC, Dibrugarh, participated in the International Symposium on Environmental Health with Special Reference to Infectious Diseases at Kochi, Japan (November 19 - 23, 2006).

Dr. T. Ramamurthy, Deputy Director, NICEED, Kolkata, participated in the WHO Global Salmonella Surveillance on Salmonella Antisera Production at Paris (November 20-24, 2006).

Dr. A.P. Dash, Director, NIMR, Delhi, participated in the Insecticide Resistance Workshop at Durban (November 22-24, 2006).

Dr. P.R. Narayanan, Director, TRC, Chennai, participated in the meeting of Partners for TB Control in South-East Asia at Jakarta (November 27-30, 2006).

Dr. Saritha Nair, Research Officer, NIRRH, Mumbai, participated in the VII Annual Conference on Population at the Cross Roads of Development at Peshawar (November 28-30, 2006).

Shri Dinesh Kumar, Senior Research officer, RMRC for Tribals, Jabalpur, participated in the VI FERACAP International Conference at Bangkok (November 28-30, 2006).

Prof. Arvind Pandey, Director, and Dr. M. Thomas, Assistant Director, NIMS, New Delhi, participated in the Meeting of UNAIDS Reference Group on Estimates, Modelling and Projections at Prague (November 29 - December 1, 2006).

Dr. A.R. Anvikar, Assistant Director, RMRC for Tribals, Jabalpur, participated in the Joint International Tropical Medicine Meeting 2006 and VI Asia Pacific Travel Health Conference at Bangkok (November 29 - December 1, 2006).

Dr. Sujatha Narayanan, Deputy Director, TRC, Chennai, Participated in the VIII International Meeting on Molecular Epidemiology and Evolutionary Genetics of Infectious Diseases at Bangkok (November 30 - December 2, 2006).

Training/Fellowship:

Participataion of ICMR Scientists in Training Programmes/Fellowships

Dr. T.N. Naik, Deputy Director (Senior Grade), NICED, Kolkata, availed Japanese Society for

Promotion of Sciences Fellowship at Hokkaido (November 1 -30, 2006).

Dr. Vikas V. Dighe, Research officer, NIRRH, Mumbai proceeded to avail Training in Assisted Reproductive Technologies at Oregon for a period of One year w.ef. November 16, 2006.

Dr. C.S. Lal and Dr. Sanjeeva Bimal, Research Officers, RMRIMS, Patna, availed Advanced WHO/TDR Refresher Course on Immunology, Vaccinology and Biotechnology applied to Infectious Diseases at Dhaka (November 29 - December 13, 2006.)

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