

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Andrew Stuart Kanter		POSITION TITLE Assistant Professor of Clinical Biomedical Informatics and Clinical Epidemiology	
eRA COMMONS USER NAME KANTERA			
EDUCATION/TRAINING ( <i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i> )			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of California, Los Angeles	BS	1985	Psychobiology
Harvard School of Public Health	MPH	1991	Tropical Public Health
Harvard Medical School	M.D.	1991	Internal Medicine
Wolfson College/ Cambridge University, UK	Visiting Sch.	1995-1998	Med Know./Comm.
Wolfson College/ Cambridge University, UK	Visiting Fellow	2006	Medical Info/Health Inf Sys

**A. Personal Statement**

Andrew Kanter is Assistant Professor of Clinical Biomedical Informatics and Clinical Epidemiology at Columbia University. Interested in application of ICT to health in the developing world, he has worked or traveled in more than 50 countries. Prior to joining Columbia, he recently spent 12 years with a private medical informatics company where he helped develop the Healthmatics EHR now being sold by Allscripts in addition to providing medical terminology and consulting services to other electronic medical record companies. He is currently appointed to Columbia University full-time in the Departments of Biomedical Informatics (College of Physicians & Surgeons) and Epidemiology (Mailman School of Public Health) and previously supported the development and implementation of the Millennium Villages Global-Network (MVG-Net) for the Millennium Villages Project (MVP). He directs the Columbia International eHealth Lab (CIEL) in the Department of Biomedical Informatics which supports eHealth work around the world. His work focuses on bringing real-world solutions to resource-poor settings to help them achieve the Millennium Development Goals.

**B. Positions and Honors****Fellowships**

1. Fellow of the American College of Medical Informatics (2011)
2. Fellow of the American Medical Informatics Association (2018)

**Board Certifications**

1. National Board of Medical Examiners (Parts I, II, III)
2. National Board of Internal Medicine- August, 1994-not renewed (#157628)

**Medical Licenses**

1. State of Illinois (permanent), 036-099330, *inactive* exp 7/31/07.

**Honors and Awards**

1. Ruth Seegal Award, (Best Thesis- Medicine and the Community) - Harvard Medical School
2. Research Travel Scholarship (Nepal) - Harvard Medical School
3. Regent's Scholarship & Chancellor's Scholarship - University of California, Los Angeles
4. College Honors (Highest Academic Honor for L&S) - University of California, Los Angeles

**Positions**

1. Assistant Professor of Clinical Biomedical Informatics and Clinical Epidemiology Columbia University, New York, NY USA 10/08 – present
2. Director, Health Information Systems/Medical Informatics Millennium Villages Project 1/07 – 5/12
3. Co-Director, Allied Disciplines Project: Wolfson College, University of Cambridge, Cambridge, UK. 1/97 – 7/98

### **C. Peer-reviewed publications**

1. Richardson ML, Pozzi-Mucelli RS, Kanter AS, Kolb FO, Ettinger B, Genant HK: Bone Mineral Changes in Primary Hyperparathyroidism. *Skeletal Radiology* 15(2):85-95, 1986.
2. \*Spach DH, Kanter AS, Dougherty MJ, Larson AM, Coyle MR, Brenner DJ, Swaminathan B, Matar GM, Welch DF, Root RK, Stamm WE. Bartonella (Rochalimaea) quintana Bacteremia in Inner-City Patients with Chronic Alcoholism: *New Engl J Med* 332(7):424-7, 1995.
3. \*Kanter AS, Spencer DC, Steinberg, MH. Development of an HIV Clinical and Research Database for South Africa. *Meth Inform Med.* 36: 144-8, 1997.
4. \*Kanter AS, Spencer DC, Steinberg MH, Soltysik R, Yarnold PR, Graham NM: Supplemental Vitamin B and Progression to AIDS and Death in Black South African Patients Infected with HIV. *Letter. J of AIDS.* 21:252-253,1999.
5. \*Kanter A, Naeymi-Rad F, Buchan IE. Right information, right patient, right time: intelligent content searching supporting point-of-care applications. *Proc AMIA Symp 2000*;403-7.
6. \*Kanter AS, Bukachi F, Johnson E. Bridging Culture and Language: IPH Search – A Pilot Global Health Information System. *Medinfo*, 2001: 406.
7. \*Cole C, Kanter A, Cummens M, Vostinar S, Naeymi-Rad F. Using a Terminology Server and Consumer Search Phrases to Help Patients Find Physicians with Particular Expertise. *Medinfo*, 2004:11(Pt 1):492-6. San Francisco, CA, Sep 7-11, 2004
8. \*Kanter A, Maldonado J, Varshney A, Naeymi-Rad F. A Mediated Health Search Portal for Trusted Medical Content. *Medinfo*, 2004:11(Pt 2):1138-41. San Francisco, California, September 7-11, 2004.
9. Seebregts CJ, Mamlin BW, Biondich PG, Fraser HS, Wolfe BA, Jazayeri D, Allen C, Miranda J, Baker E, Musinguzi N, Kayiwa D, Fourie C, Lesh N, Kanter A, Yiannoutsos CT, Bailey C; The OpenMRS Implementers Network. *Int J Med Inform.* 2009 Jan 19.
10. \*Kanter AS, Negin J, Olayo B, Bukachi F, Johnson E, Sachs SE. Millennium Global Village-Net: Bringing together Millennium Villages throughout sub-Saharan Africa. *Int J Med Inform.* 2009 Dec;78(12):802-7. Epub 2009 Sep 18.
11. \*Kanter AS, Dick J, Bukachi F, Johnson E, Borland C, Dusabe S, Wariero O and Sachs ES. Update on the Millennium Global Village-Net: Status and Lessons Learned. HELINA 2009, Abidjan, Cote d'Ivoire, 2009.
12. Tierney WM, Kanter AS, Fraser HSF, Bailey C. A Toolkit For eHealth Partnerships in Low-Income Nations. *Health Affairs.* Supplement 2010; 29(2): 268-273.
13. Ohemeng-Dapaah S, Pronyk P, Akosa E, Nemser B and Kanter AS. Combining Vital Events Registration, Verbal Autopsy and Electronic Medical Records in Rural Ghana for Improved Health Services Delivery. *MedINFO 2010*, Cape Town, South Africa, Sept 2010.
14. Braa J, Kanter AS, Lesh N, Crichton R, Jolliffe B, Sæbøe J, Kossi E, Seebregts C. Comprehensive Yet Scalable Health Information Systems for Low Resource Settings: A Collaborative Effort in Sierra Leone. *AMIA*, Washington, DC Nov 2010
15. Ingun P, Streveler D, Brown K, Kanter A, Rietberg A and Hesp C. Technical Brief Series - Brief No 10: THE ROLE OF INFORMATION SYSTEMS IN ACHIEVING UNIVERSAL HEALTH COVERAGE. World Health Organization, December, 2010.
16. Mechael P, Nemser B, Cosmaciuc R, Cole-Lewis H, Ohemeng-Dapaah S, Dusabe S, Kaonga NN, Namakula P, Shemsanga M, Burbach R, Kanter AS. Capitalizing on the Characteristics of mHealth to Evaluate Its Impact. *J Health Commun.* 2012 May 2;17 Suppl 1:62-6.
17. \*Kanter AS, Borland R, Barasa M, Iiams-Houser C, Velez O, Kaonga N, Berg M. The importance of using open source technologies and common standards for interoperability within eHealth: Perspectives from the Millennium Villages Project. *Adv Health Care Manag.* 2012;12:189-204.
18. Vawdrey DK, Natarajan K, Kanter AS, Hripcsak G, Kuperman GJ, Stockwell MS. Informatics Lessons from Using a Novel Immunization Information System. *Proc of World Congress on Medical Informatics (Medinfo'13)*, 2013 *Stud Health Technol Inform.* 2013;192:589-93.
19. Kaonga NN, Labrique A, Mechael P, Akosah E, Ohemeng-Dapaah S, Sakyi Baah J, Kodie R, Kanter AS, Levine O. Using social networking to understand social networks: analysis of a mobile phone closed user group used by a Ghanaian health team. *J Med Internet Res.* 2013 Apr 3;15(4):e74. doi: 10.2196/jmir.2332.
20. Kaonga NN, Labrique A, Mechael P, Akosah E, Ohemeng-Dapaah S, Baah-Sakyi J, Kodie R, Kanter AS, Levine O. Mobile phones and social structures: an exploration of a closed user group in rural Ghana. *BMC Medical Informatics and Decision Making.* 2013;13:100. DOI: 10.1186/10.1186/1472-6947-13-100.
21. Vélez O, Okyere PB, Kanter AS, Bakken S. A Usability Study of a Mobile Health Application for Rural Ghanaian Midwives. *J Midwifery Womens Health.* 2014 Jan 8. doi: 10.1111/jmwh.12071.
22. Blanas DA, Ndiaye Y, MacFarlane M, Manga I, Siddiqui A, Velez O, Kanter AS, Nichols K, Hennig N. Health worker perceptions of integrating mobile phones into community case management of malaria in Saraya, Senegal. *Int Health.* 2015 May;7(3):176-82. doi: 10.1093/inthealth/ihu075. Epub 2014 Oct 14.
23. Oza S, Jazayeri D, Teich JM, Ball E, Nankubuge PA, Rwebembera J, Wing K, Sesay AA, Kanter AS, Ramos GD, Walton D, Cummings R, Checchi F, Fraser HS Development and Deployment of the OpenMRS-Ebola Electronic Health Record System for an Ebola Treatment Center in Sierra Leone. *J Med Internet Res* 2017;19(8):e294 DOI: 10.2196/jmir.7881

24. Sarma S, Nemser B, Cole-Lewis H, Kaonga N, Negin J, Namakula P, Ohemeng-Dapaah S, Kanter AS. Effectiveness of SMS Technology on Timely Community Health Worker Follow-Up for Childhood Malnutrition: A Retrospective Cohort Study in sub-Saharan Africa. *Global Health: Science and Practice* Jun 2018, 6 (2) 343-353; DOI: 10.9745/GHSP-D-16-00290
25. Rose E, Rube S, Kanter AS, Cardwell M, Naeymi-rad F. Integration of Postcoordination Content into a Clinical Interface Terminology to Support Administrative Coding. *Appl Clin Inform* 2019; 10(01): 051-059; DOI: 10.1055/s-0038-1676972

#### **D. Selected other relevant peer-reviewed publications**

1. \*DeWitt DE and Kanter AS. Computer Diagnostic Assistants: Useful Tools for Clinicians and Educators?. *J Gen Intern Med* 9:653-4, 1994 (1<sup>st</sup> Informatics Publication).
2. \*Kanter AS. Topics for Our Times: Lessons from Cambodia and Site-2. *Am J Pub Hlth.* 85(5): 620-1, May, 1995.
3. \*Spach DH, Kanter AS, Daniels NA, Nowowiejski DJ, Larson AM, Schmidt RA, Swaminathan B, Brenner DJ. Bartonella (Rochalimaea) quintana Endocarditis: Case Report and Review. *Clin Infect Dis.* 20:1044-7. April, 1995.
4. \*Kanter AS, Stewart BF, Costello JA, Hampson NB. Myocardial infarction while scuba diving: A Case Report and Review. *Am Heart J.* 130: 1292-4, 1995.

#### **E. Other abstracts and posters**

1. Pozzi-Mucelli RS, Kanter AS, Genant HK, Cann CE, Ettinger B, Kolb FO: Quantitative Bone Mineral Analysis in Primary Hyperparathyroidism. *J Comput Assist Tomogr* 7:555, 1983.
2. Genant HK, Cann CE, Pozzi-Mucelli RS, Kanter AS: Vertebral Mineral Determination by Quantitative CT: Clinical Feasibility and Normative Data. *J Comput Assist Tomogr* 7:554, 1983.
3. Cann CE, Genant HK, Kolb FO, Kanter AS: Male Idiopathic Osteoporosis: Patterns of Bone Loss May Indicate Heterogeneity. *American Society for Bone and Mineral Research*, 1984.
4. Richardson ML, Heller M, Kanter AS, Salem A, Morgan JA, Cann CE, Genant HK: Comparison of Methods for Noninvasive Assessment of Skeletal Bone Mass. *American Roentgen Ray Society*, Las Vegas, 1984.
5. Spach DH, Larson AM, Coyle MB, Kanter AS, Welch DF, Stamm WE. Unanticipated Rochalimea quintana bacteremia in patients with chronic alcoholism. In: *Programs and Abstracts of the 33rd Interscience Conference on Antimicrobial Agents and Chemotherapy*. New Orleans, LA 1993.
6. \*Kanter AS, Spencer DC, Steinberg MH: An HIV Clinical and Research Database for South Africa. *Health Informatics in Africa (HELINA '96)*. Johannesburg, South Africa 1996.
7. Kepic T, Naeymi-Rad F, Almeida F, Kanter A, Trace D.A. Computerized Patient Prenatal Record for the Primary Care Provider. *XV FIGO World Congress*, Copenhagen, 1997.
8. \*Kanter AS, Spencer DC, Steinberg MH: Supplemental Vitamin B Complex Associated with Delay in Progression to AIDS/Death in South African Patients Infected with HIV. In: *Program and Abstracts of the 5th Conference on Retroviruses and Opportunistic Infections*. Chicago, IL 1998. Note that this hypothesis was later confirmed in a landmark study: Fawzi WW, Msamanga GI, Spiegelman D, et al. A randomized trial of multivitamin supplements and HIV disease progression and mortality. *N Engl J Med* 2004;351:23-32.
9. \*Pham-Kanter GB, Kanter A, Spencer DC, Steinberg MH: Characterizing an Epidemic: 10 years of Patient Attendance at a South African HIV Clinic. In: *Program and Abstracts 12th World AIDS Conference*. Geneva, Switzerland 1998.
10. \*Kanter AS, Spencer DC, Steinberg MH: Incidence and characteristics of HIV-related conditions in distinct South Africa patient populations. In: *Program and Abstracts of the 12th World AIDS Conference*. Geneva, Switzerland 1998.
11. \*Kanter AS, Naeymi-Rad F, Buchan I. Enhanced Access at the Point-of-Care to On-Line Multimedia Medical References using Standardized, Concept-Coded Indexing. *AILA*, Tokyo, August, 1999.
12. \*Johnson E, Kanter AS, Garner M. Communication Within Healthcare Systems: Increasing Understanding with Filter and Optical Metaphors. *AILA*, Tokyo, August, 1999.
13. \*Meyers KC, Kanter AS, Charlot C, Naeymi-rad F. The Follow-up note: Format and Requirements, Specifications for the Computerized Medical Record. *AMIA*, 2000.
14. Kepic T, Blankstein J, Kanter A, Charlot R, and Naeymi-Rad F. Using the Internet To Supplement Core Curriculum Lectures in Ob/Gyn Training. *Obstet Gynecol* 2001 Apr;97(4 Suppl 1):S57-S58.
15. Naeymi-Rad F, Kanter A, Charlot R, Meyers K, Paul M. -EMRTM: Intelligent Electronic Medical Record System: Functional, Structural, Modular and Integrated Components. *DMAA*, Poster Presentation, 2004.
16. \*Kanter AS, Wang A, Naeymi-Rad F, Safran C. Interface Terminologies Bridge the Gap between Theory and Reality for Africa. Accepted *HELINA 2007*, Bamako, Mali, January, 2007.
17. \*Mechael PN, Kanter AS, Lesh N, Dhadialla P, Kramers A. Open Source mHealth Applications and the Millennium Development Goals for Africa. Accepted *MIE 2008*, Gothenburg, Sweden, May 2008.
18. \*Kanter AS, Wang A, Masarie FE, Naeymi-Rad F, Safran C. Interface Terminologies Bridge the Gap between Theory and Reality for Africa. Accepted *MIE 2008*, Gothenburg, Sweden, May, 2008.

Principal Investigator/Program Director (Last, First, Middle): **Kanter, Andrew Stuart**

19. \*Were MC, Seebregts C, Wolfe B, Mamlin B, Biondich P, Fraser HSF, Kanter AS. Collaboration and Communication Tools in a Rapidly Expanding Global Open-Source EMR Initiative. Spring AMIA, Orlando FL, May, 2009.
20. Mechael P, Kanter AS, Drucker E, Kwan A. mHealth Extensions to HIV and AIDS eHealth Systems. Spring AMIA, Orlando FL, May 2009.
21. Dick J, Okongo M, Siriri D, Atuhahire E, Namakuka P, Kanter AS. OpenMRS as a Key Malaria Intervention. PHIN, Atlanta, GA, August, 2009
22. Charlot RC, Cole CL, Cheriff AD, Wang AY, Oganeseva A, \*Kanter AS, Naeymi-Rad F. Finding Specialists Using Interface Terminology and Concept-Based Hierarchical Reference Terminology. VIVO, New York, August 2010.
23. Nemser B, Cole-Lewis H, Mechael M, Kanter AS. Evaluating Impact of Health Information Technology Applied to Clinics and Communities: The Millennium Global Village-Network. mHealth Summit, Washington, DC, Nov. 2010.
24. Payne J, Fazen L, Kanter AS, Walji A, Zornetzer H, Treatment D, Ollis S, Routen T, Ramachandran D, MacLeod B, Marcelo AB, Fraser H, Leshe N. Development of Common Maternal Health Concept Dictionary for Mobile Platforms; the formation of the Mobile Maternal Health Working Group. mHealth Summit, Washington, DC, November 2010.
25. Velez O, Mechael P, Kanter A, Bakken, S. Information Needs and Technical Self-Efficacy of Midwives in Rural Ghana. AMIA 2011, Washington, DC, October 2011.
26. Carlo L, Kaonga NN, Kodie R, Velez O, Kanter AS. A Communicative Landscape of Health Information Needs for Malaria Management in the Millennium Villages Project in Bonsaaso, Ghana. AMIA 2012, Chicago, IL, November 2012.
26. Abbott PA, Mendoza C, Kanter R, Fort M, Kanter A, Friedman C. Reducing Risk of CVD in Rural Guatemala with Integrated mHealth Interventions. Stud Health Technol Inform. 2013;192:1262.
27. Ogallo W, Kanter AS. Modelling the Medication Management System for Resource Limited Settings: A Formal Representation of the Prescribing and Dispensing Phases. Stud Health Technol Inform. 2015;216:1106.
28. Ogallo W, Kanter AS. Towards a Clinical Decision Support System for Drug Allergy Management: Are Existing Drug Reference Terminologies Sufficient for Identifying Substitutes and Cross-Reactants? Stud Health Technol Inform. 2015;216:1088.
29. Carlo L, Bakken S, Mamykina L, Kodie R, Kanter AS. Towards a Tool for Malaria Supply Chain Management Improvement in Rural Ghana. Stud Health Technol Inform. 2015;216:1006.
30. Jazayeri D, Oza S, Ramos G, Fraser H, Teich JM, Kanter AS, Ball E. Design and development of an EMR for Ebola Treatment Centers in Sierra Leone using OpenMRS. Stud Health Technol Inform. 2015;216:916.
31. Ogallo W, Kanter AS. Using Natural Language Processing and Network Analysis to Develop a Conceptual Framework for Medication Therapy Management Research. AMIA Annu Symp Proc. 2017 Feb 10;2016:984-993. eCollection 2016.

## **F. Ongoing Research Support**

*None*

## **G. Prior Research Support**

Open Architecture Standards and Information Systems (OASIS II)

2009-2011

Role: Co-PI

This grant from the International Development Research Center (Canada) for \$650,000 supported research into the impact of ICT systems such as the Millennium Global Village-Network on health outcomes and capacity building along with the development of a multi-lingual, multi-national data dictionary for use in primary care in Africa.

Columbia Global eHealth Program

2009-2012

Role: PI

This grant from the Rockefeller Foundation for \$1.2M supports the development of a Center at Columbia for Global eHealth including research, implementation and analysis of the Millennium Global Village-Network, a ten country-wide African information system and data warehouse.

Ethiopia mHealth Roadmap Project

2011-2012

Role: PI

This contract from the Bill and Melinda Gates Foundation for over \$1M supports a strategic requirements development process and a pilot implementation of an mHealth information system for Health Extension Workers within the Primary Care Development Program of the Federal Ministry of Health of Ethiopia.

*No Prior NIH Research Grants*

Professional Organizations and Societies

1. Fellow of the American College of Medical Informatics 2011-
2. Member Board on Global Health, National Academies of Science, Engineering and Medicine 2018-
3. Intelligent Medical Objects, Inc. Member of Board of Directors, 2006-2016
4. International Physicians for the Prevention of Nuclear War. International Councilor from the USA 2004-2005, Deputy Councilor from the USA 2006-2007, At-Large Member of Board of Directors, 2006-2008, 2010-2015
5. Physicians for Social Responsibility, Regional Director 2003-2006, At-Large Member 2007-2010, President 2012
6. American Medical Informatics Association, International Affairs Committee, 2005-2015, Fellow 2018-

Other Professional Experience

Medical Informatics

1. Medical Software Development: Media Design Interactive, Surrey, U.K. 1/ 91-12/ 91  
Designed and wrote computer-based advanced first aid tutorial system called "What to do before the ambulance arrives" for Macintosh Hypercard systems. Published CD-ROM multi-media version with Media Design Interactive, UK, 1991.
2. Development of a Regional Standardized HIV/ AIDS Clinical-  
Research Database for South Africa: Johannesburg, South Africa 9/ 94-10/ 94  
While on short-term contract with the National AIDS Research Programme of the Medical Research Council of South Africa, coordinated discussions on a standardized computer database for HIV/ AIDS patients in South Africa. Created a prototype database using Microsoft Access™, and completed a proposal to fund a staged implementation of the database and health information system in the Cape Town and Johannesburg regions.
3. Co-Director, Allied Disciplines Project: Wolfson College,  
University of Cambridge, Cambridge, UK. 1/ 97-7/ 98  
Co-founded the Allied Disciplines Project (ADP) with Dr. Edward Johnson at Wolfson College. ADP is an experiment in cross-discipline research where experts in different academic disciplines come together to share their discipline-based expertise to solve fundamental issues related to knowledge acquisition, storage, retrieval and transfer. Developed a heuristic model to describe knowledge transfer presented in Copenhagen in February 1998.
4. Director, Health Information Systems/ Medical Informatics  
Millennium Villages Project  
Earth Institute/ Columbia University 1/ 07 – present  
Responsible for design, development and implementation of the Millennium Global Village-Network (MGV-Net) linking together clinicians, health workers and researchers among the Millennium Villages in twelve locations and ten countries throughout Africa.
5. Board of Directors, Intelligent Medical Objects 9/ 08 – present  
Chief Medical Office, Intelligent Medical Objects 6/ 06 – 9/ 08  
President and Chief Medical Officer, Intelligent Medical Objects 10/ 00 – 6/ 06  
Chief Operating Officer: Intelligent Medical Objects, Inc.,  
Chicago, IL, USA 1/ 98 – 10/ 00  
Acting Vice President For Clinical Affairs 7/ 95 – 1/ 98  
Started position as Chief Medical Officer and President of the company in October, 2000. Stepped down to just Chief Medical Officer in June, 2000. Prior to that, was Chief Operating Officer for IMO. Responsible for clinical direction of company (including outcomes research and disease management), employee management and Research and Development. Oversaw IMO's participation in Glaxo Wellcome-sponsored Collaboration in HIV Outcome Research-US (CHORUS) including complete development of Retrospective Data Entry tool for

use with HealthPoint ACS electronic medical record. Oversaw creation of Interface Terminologies for Health Care, IMO's relationship with Epic Systems and Misys. Appointed to IMO Board of Directors in 2008.

6. Director, Health Information Systems/ Medical Informatics 6/ 06 - present  
Millennium Villages Project, Earth Institute, Columbia Univ.  
New York, NY, USA

Originally began position during Visiting Fellowship at Cambridge University 7/ 1/ 2006 pro bono, but then became a 50% consultant to MVP in 1/ 1/ 2007 to 9/ 1/ 2008. Became full time with faculty appointment to Columbia University in 9/ 2008. Primary responsibility currently is design and implementation of health information systems in clinics throughout MVP projects sites in 10 countries, including analysis and data warehousing tools, research and service reporting. Also direct the Columbia Global eHealth Program.

#### Research

1. Development and Clinical Evaluation of Quantitative Computed Tomography (QCT).  
A broad program in the development and use of QCT to study specific clinic problems. It included the development of a computerized analysis system to generate statistical data on various parameters associated with QCT and bone mineral. Worked under the direction of Harry K. Genant, University of California, San Francisco, Department of Radiology. (1982-1984).
2. Respiratory Illnesses in the Philippines  
A study of the various parameters affecting the health of Filipinos living on the island of Mactan, particularly those impacting on respiratory disease, was performed in January 1988. The study included a door-to-door survey and examination of 463 families and a case-selected survey of hospital admissions. In addition to gathering subjective and objective information about respiratory illnesses, measurements of childhood age, weight and arm circumference were performed. (1988).
3. Comprehensive Primary Health Care in Nepal - A Case Study  
Returning to the district I worked in eight years before, I evaluated one example of an integrated primary health care (PHC) project in Nepal, the United Mission to Nepal's Community Development and Health Project. A door-to-door survey was performed to compare services before and after the implementation of PHC. Villagers, health workers, and program administrators were asked about their attitudes and priorities regarding primary health care. (1990-Medical School Thesis).
4. Primary Health Care and Nutrition in Rural Kenya  
Participatory Rural Appraisal, an approach to developing community-based resource management plans, was used to assess primary health care and childhood nutrition for a rural community in Machakos, Kenya. An international team of medical students and physicians from the USA, the Philippines, Germany, Lithuania, USSR, and Kenya participated in the assessment. A drop in nutritional status in the second year of life demonstrated the potential effect of weaning on malnutrition (1990).
5. Effects of Living in Refugee Camps on Cambodian Children  
Conducted a descriptive study of the physical, social and psychological effects on children living in Site-2, one of the "Displaced Person" camps along the Thai-Cambodia border. Research was based primarily on interviews with people and staff living and working in the camp. (1991)
6. Bartonella (Rochalimaea) quintana Infection in the Homeless Community  
Collaborated with David H. Spach on examining the potential clinical importance of Bartonella quintana (Bq) infection. A case report and review of the literature postulates Bq as another important cause of culture-negative endocarditis. In addition, a case-control study at Harborview Medical Center in Seattle showed that Bq was an important occult source of fever in debilitated patients, and that homelessness was a significant risk factor for Bq-induced fevers. (1993-4).

7. Natural History and Related-Conditions of HIV Infection in South Africa  
Developed a comprehensive clinical observational database for Johannesburg General Hospital HIV Clinic including over 2000 complete medical records of HIV-infected patients from 1985-1997. Worked with Drs. David Spencer and Malcolm Steinberg to describe effects of Vitamins on HIV disease progression as well as incidences of opportunistic infections. A description and analysis of clinic utilization was also performed. Data presented at 5<sup>th</sup> Conference on Retroviruses and Opportunistic Infections and 12<sup>th</sup> World AIDS Conference. (1994-2000)
8. Medical Knowledge- Acquisition, Storage, Retrieval and Transfer  
Working as Co-Director of the Allied Disciplines Project and a Visiting Scholar at Wolfson College, Cambridge University (UK), developed heuristic model for communication within health care systems. Combining experience in medical informatics, general medicine, linguistics, operational communications, anthropology, history and engineering, the model uses an optical metaphor to identify critical processes for effective communication of medical knowledge. In addition, a unique methodology for mapping of standardized concepts to medical reference with authenticated distribution over the Internet was developed along with the Cambridge Centre for Clinical Informatics.
9. Medical Terminology and Health Information Systems in Resource-poor Settings  
Most of my current research involves the implementation of multi-lingual, multi-national health information systems in resource-poor settings through design, implementation and evaluation/ research of the open source Millennium Global Village-Network (MGV-Net), and the common, multilingual data dictionary which lies at its center.

#### Clinical

1. Supervisor - EMS, Neonatal/ Pediatric/ Maternal Transport Program, UCLA Center for the Health Sciences, Los Angeles, CA 4/ 84/ 9/ 84  
Responsibilities included supervision of EMTs and equipment necessary to operate the UCLA Hospital's neonatal/ pediatric/ maternal emergency ground transport program.
2. Asst. Administrator, Emergency Medical Services - UCLA Dept. of Community Safety, Los Angeles, CA 8/ 84-6/ 85  
Responsible for overseeing Emergency Medical Services (EMS) system for the UCLA campus and surrounding city. The EMS system included three supervisors, 30 emergency medical technicians, one neonatal transport ambulance and two basic life support ambulances. Other responsibilities included staffing, purchasing and maintaining equipment, and cardiopulmonary resuscitation (CPR) and emergency medical technician (EMT) training. Began work on developing both operational and treatment guidelines for the program.
3. Visiting Medical Student - Kenyan Medical Research Institute, Nairobi, Kenya 6/ 86  
Trained with physician in rural Kenya in the diagnosis/ treatment of leishmaniasis & schistosomiasis control.
4. Visiting Medical Student - Muhimbili Medical Center and Aga Khan Hospital, Dar es Salaam, Tanzania 7/ 86-8/ 86  
Trained with a radiologist in both public and private practice. Met with medical students to discuss future North-South exchanges.
5. Visiting Medical Student - Luanshya Hospital/ Zambia Consolidated Copper Mines (ZCCM), Luanshya, Zambia 8/ 86  
Trained with the Chief Medical Officer for ZCCM in a general medicine inpatient care facility. Helped develop a plan for reorganizing the mine's emergency medical services.

6. Medical Intern - University of Washington, Seattle, WA 7/ 91-7/ 92  
First year post-graduate physician with primary responsibility for the in-hospital care of patients admitted to hospitals in the University of Washington system. Areas of training/ care included general medicine, intensive/ cardiac care medicine, emergency room care, HIV/ AIDS clinic and outpatient primary care through a continuity clinic consisting of a panel of 100-200 patients.
7. Visiting Physician - McCormick Hospital, Chiang Mai, Thailand 9/ 92-10/ 92  
Full-time responsibilities included inpatient admissions to Internal Medicine/ Cardiology service, care of AIDS patients, intensive care medicine and visits to primary care and development sites.
8. Visiting Physician - University of Zimbabwe, Departments of Medicine and Community Medicine, Harare, Zimbabwe 10/ 93-11/ 93  
Responsibilities included rotations with inpatient medicine teams at Parirenyatwa and Harare Hospitals as well as AIDS/ infectious disease consult services at Beatrice Hospital. Gave lectures to the Harare City Health Office and Dept. of Community Medicine at University of Zimbabwe Medical School.
9. Junior/ Senior Medical Resident - University of Washington, Seattle, WA 7/ 92-7/ 94  
Responsibilities included supervision and teaching of in-hospital care teams and providing continuity care to outpatients. Areas of training include general medicine, intensive/ coronary care medicine, HIV/ AIDS, oncology, as well as Medic One Doctor for the Harborview Medical Center Emergency Trauma Center, and base-station physician for the regional paramedic system.
10. Chief Medical Resident - Providence Medical Center, Seattle, WA  
Acting Instructor - University of Washington, Seattle, WA 6/ 94-7/ 95  
Responsibilities included: supervision and teaching of medical housestaff service, coordinating weekly conferences and introducing Medical Grand Rounds at the University of Washington. I helped to implement a computerized records system allowing residents to access electronic medical information, produce an electronic medical record, and create a relational database of all patients admitted to the housestaff services.

#### Community Development

1. Community Development Worker - Water Development/ Health Project:  
United Mission to Nepal/ Project Nepal, Kathmandu, Nepal 9/ 79-12/ 79  
Worked with Nepali staff on water development project in which 13,000 meters of PVC pipe was laid along the mountain ridges of Ikudol Panchayat. Also worked with a health assistant in a remote rural health clinic.
2. Coordinator - Project 88, Community Development Project: Harvard Medical School and Mactan Island, the Philippines 3/ 87-1/ 88  
Helped organize a one month community service project on Mactan island in the Philippines. Participants were Harvard medical students, who were responsible for project design, fundraising and evaluation. The project centered around the study of respiratory diseases and the construction of health clinics. Designed and constructed a village latrine and started mini-project to fund ongoing latrine construction throughout the island.
3. Program Leader- Public Health and Diplomacy Project: Harvard School of Public Health and Machakos, Kenya 3/ 90-8/ 90  
Developed and coordinated project in which medical students and physicians from East, West and South (represented by the USA, Philippines, Germany, Lithuania, Russia, and Kenya), worked together on a public health project in Kenya. Primary responsibilities included recruiting participants, fundraising, and project design. Project was part of a larger program designed to provide the participants with a unique experience of international cooperation for health. Emphasis was placed on Participatory Rural Appraisal (PRA) in the area of nutrition.