PHI 2007

Creating a Global Partnership in Public Health Informatics

September 17-18, 2007
Bell Harbor International Conference Center
Seattle, WA

PHI2007: Creating a Global Partnership in Public Health Informatics

Agenda
Monday, September 17, 2007

7:30 Breakfast: Bell Harbor International Conference Center

8:30 – 8:45 Welcome and Introductions

Peter Dunbar, MD, Member, Steering Committee, PHI2007; Associate Professor, Anesthesiology, School of Medicine; Faculty, Center for Public Health Informatics, School of Public Health and Community Medicine, University of Washington

United States Congressman Jim McDermott, MD

King Holmes, MD, Chair, Department of Global Health, Schools of Medicine and Public Health and Community Medicine, University of Washington

Sherrilynne Fuller, PhD, Chair, Steering Committee, PHI2007; Professor, Biomedical and Health Informatics, School of Medicine; and Co-Director, Center for Public Health Informatics, School of Public Health and Community Medicine, University of Washington

8:45 – 9:30 Key Note Address: Building the global infrastructure for public health Informatics: Key issues for care, education, research, and policy

Don Detmer, MD, MA, President and Chief Executive Officer of American Medical Informatics Association

9:30 – 10:00 Break - Visit posters and displays

10:00 – 12:00 Plenary Session I: Issues in Knowledge Management and Education: Opportunities and Challenges

Session Chair: *Sherrilynne Fuller, Chair, Steering Committee, PHI2007 and Co-Director, Center for Public Health Informatics, University of Washington*

- ◆ Toward a Global Vision of Interoperability
  Charles Friedman, PhD, US Office of the National Coordinator (ONC) for Health Information Technology

- ◆ Building biomedical and health informatics research and development capacity through academic partnerships
  Walter H. Curioso, MD, MPH Universidad Peruana Cayetano Heredia, and Affiliate Assistant Professor, University of Washington

- ◆ Using Low Bandwidth Electronic Communication Systems for the Community and Public Health Workforce
  Patricia A. Abbott, RN, PhD, FAAN, Co-Director of the PAHO/WHO KIMS Collaborating Center, School of Nursing, Johns Hopkins Universit

- ◆ A Revolution in Web-Based Public Health Information Dissemination and Evaluation
  Elliot Siegel, PhD, Associate Director for Health Information Programs Development, National Library of Medicine

Monday September 17, 2007 continued

12:00 – 1:00: Lunch and informal discussions. Visit posters and displays

1:00 – 3:00 Session II: Global Health Situational Awareness

Session Chair: *Bill Lober, Associate Professor, Medical Education and Biomedical Informatics, School of Medicine, University of Washington and Member, Steering Committee, PHI2007*

- The Global Perspective: International Health Regulations and Health Information Systems in Developing Countries
  Sally Stansfield, MD, Executive Secretary, Health Metrics Network, World Health Organization

- International Health Regulations: U.S. Government Implementation and the Role of CDC and Public Health Informatics
  Scott McNabb, PhD, MS, Director, Division of Integrated Surveillance Systems and Services, National Center for Public Health Informatics, Centers for Disease Control and Prevention

- Epidemiologic Surveillance in Developing Countries
  Lt Colonel Julie Pavlin, MD, MPH, US Army Medical Corps

- Digital Inclusion for Health
  Tom Healy, Program Manager External Research and Programs Group, Microsoft Research

3:00 – 3:20 Break – Visit posters and displays

3:20 – 4:20 Reactor Panel I

Moderator: *Dr. Patrick O'Carroll, MD, MPH, FACPM, FACMI, Rear Admiral and Assistant Surgeon General in the U.S. Public Health Service, Regional Health Administrator (RHA) for USPHS Region X*

Iain Buchan, MD, FFPH, Director, Northwest Institute for Bio-Health Informatics, University of Manchester and Member, Steering Committee, PHI2007

Herman Tolentino, Acting Head, Informatics Fellows Program, U.S. Centers for Disease Control and Prevention

Dimitar Hristovski, PhD, Assistant Director, Institute of Biomedical Informatics, University of Ljubljana, School of Medicine

Juan Eugenio Hernandez Avila, Director de Informática y Geografía Médica /Informatics and Medical Gepgraphy Department Instituto Nacional de Salud Pública/National Institute of Public Health, Morelos, México

Ann Marie Kimball, MD, MPH, FACPM, Professor, Epidemiology, Health Services; Adjunct Professor, Depts. Biomedical and Health Informatics and Medicine, School of Public Health and Community Medicine; Director, Asia Pacific Economic Cooperation Emerging Infections; Director, "Amauta" Global Informatics Research and Training Program; and Director, Framework for Global Health: Local to Global, University of Washington

4:20 – 5:30 Small Group Working Session

Monday September 17, 2007 continued

5:30 Adjourn

7:00 - 10:00 Royal Argosy Dinner Cruise

Welcome and Introductions: *Mark W. Oberle, MD, MPH Co-Director, Center for Public Health Informatics; Associate Dean, Public Health Practice, School of Public Health and Community Medicine; Professor of Epidemiology and Health Services, Medical Education and Biomedical Informatics*

Dinner Speaker: *Christopher Murray, MD, D.Phil, Professor, Global Health and Director, Institute for Health Metrics and Evaluation, University of Washington*

Tuesday, September 18, 2007

7:30 Breakfast: Bell Harbor International Conference Center

8:00 – 10:00 Session III: Global Drug Safety Initiatives: Opportunities and Challenges in Assessment and Intervention

Session Chair: *Andy Stergachis, PhD, Professor of Epidemiology and Global Health; Adjunct Professor of Pharmacy, University of Washington; and Member, Steering Committee, PHI2007*

- ◆ Assuring Effective Antimalarial Treatment: A Plan For Moving Forward
WARN: World Antimalarial Drug Resistance Network
Carol Sibley, PhD, Professor, Department of Genomics, University of Washington

- ◆ Developing a Global Strategy for the Conduct and Use of Pharmacovigilance
Andy Stergachis, PhD, Professor of Epidemiology and Global Health and Adjunct Professor of Pharmacy, University of Washington

- ◆ Phase IV Programs for New Medical Commodities: What, Why, How
Thomas P. Kanyok, PharmD, Senior Program Officer, Field Studies-Infectious Diseases, Global Health Program, Bill and Melinda Gates Foundation

- ◆ Informatics Tools to Improve Drugs Management and Safety in Developing Countries
Hamish Fraser, MBChB, MRCP, MSc, Assistant Professor of Medicine, Harvard Medical School and Associate Physician, Brigham and Womens Hospital

10:00 – 10:15 Break - Visit posters and displays

10:15 – 12:00 Reactor Panel II

Moderator: *Patrick O'Carroll, MD, MPH, FACPM, FACMI, Rear Admiral and Assistant Surgeon General in the U.S. Public Health Service, Regional Health Administrator (RHA) for USPHS Region X*

Dr. Rajan Madhok, Primary Care Trust Clinical Director, CSC Alliance United Kingdom and Honorary Professor, University of Manchester, Member, Steering Committee, PHI2007\

Dr. Roddy Stusser, MD, MSc, MPH, Freelance Researcher, Clinical-Health Biostatistics, Adviser, Primary Health Care Informatics, Cuban MINSAP and National Institutes of Health

Kristin Tolle, PhD, Program Manager, External Research and Programs Group, Biomedical Informatics, Microsoft Research

Lucila-Ohno Machado, MD, PhD, Director, Informatics for Global Health Training Program, Harvard University

Bedirhan Ustun, Head, Classification, Assessment and Terminology, World Health Organization and Member, Steering Committee, PHI2007

12:00 – 1:00 Lunch: Bell Harbor International Conference Center

Informal discussions and visit posters

1:00 – 2:45 Plenary Work Session

Reports from small group discussions and determine future work

Tuesday, September 18, 2007 continued

2:45 – 3:00 Break

3:00 – 4:00 Summary and Next Steps

Dave Ross, ScD, Director, Public Health Informatics Institute

4:00 pm Adjourn

Speaker Biographies

Patricia Abbott has been a nurse since 1977 when she received her AA degree in nursing from Harford Community College. She completed her BSN in 1989, a Masters in Nursing Informatics in 1992, a PhD in Operations Analysis/Information Science in 1999 and now is currently a research fellow in the Division of Health Sciences Informatics at the Johns Hopkins School of Medicine. She is currently on sabbatical from the Schools of Medicine and Nursing at Johns Hopkins where she holds joint appointments. Dr. Abbott is a member of the JAMIA Editorial Board and just completed a 6 year term on the Board of Directors for the American Medical Informatics Association. She is the Vice Chair of the Nursing Informatics Special Interest Group of the International Medical Informatics Association and is the Co-Director of the WHO/PAHO Collaborating Center for Nursing Knowledge, Information Management & Sharing at the JHUSON. In her work with the WHO, she is working to develop IT for low-resource settings in an effort to increase knowledge distribution to nurses, midwives, and other care-givers in remote communities. Dr. Abbott has been involved in informatics for many years, has numerous publications and has delivered many keynote & scientific addresses for various organizations.

Patti is currently studying with Dr. Ben Shneiderman in the Human Computer Interaction Laboratory in the Department of Computer Science at the University of Maryland College Park. She is researching the relationship between HIT facilitated medical error and system design.

Walter H. Curioso is a physician from Peru who received his MPH at the University of Washington. He is a research professor in Health Informatics at Universidad Peruana Cayetano Heredia in Lima, Peru, and has a joint appointment at the Division of Biomedical and Health Informatics at UW. Dr. Curioso's research focus is on using technology to promote global health in developing countries. His projects include using cell phones to collect data from sex workers, and using PDAs for ART adherence messages among HIV patients.

Don E. Detmer, MD, MA, is President and Chief Executive Officer, American Medical Informatics Association. He is also Professor of Medical Education in the Department of Public Health Sciences at the University of Virginia, and Visiting Professor at CHIME, University College of London. Don is a member of the US Institute of Medicine as well as a lifetime Associate of the National Academies, a fellow of AAAS as well as the American Colleges of Medical Informatics, Sports Medicine, and Surgeons. He chairs the board of MedBiquitous, an educational standard setting organization, and also co-chairs the Blue Ridge Academic Health Group, a policy group of academic health center leaders. He sits on the AHIC Security and Confidentiality Subcommittee in US Department of Health and Human Services and the Governor's Health Information Technology Council of Virginia.

Dr. Detmer is past chairman of the Board on Health Care Services of the IOM, the National Committee on Vital and Health Statistics, and the Board of Regents of the National Library of Medicine. He was a Commissioner on the President's Commission on Systemic Interoperability. He chaired the 1991 IOM study, "The Computer-based Patient Record" and co-edited the 1997 version of the same report. He was a member of the committee that developed the IOM Reports, 'To Error is Human' and "Crossing the Quality Chasm." From 1999-2003 he was the Dennis Gillings Professor of Health Management at Cambridge University and is a lifetime member of Clare Hall College, Cambridge.

He has been a consultant to the government of England and the Hospital Authority of Hong Kong. Prior to the years in England, he was Vice President for Health Sciences at the Universities of Virginia and Utah. While at Virginia he led implementation of a physician order entry system and was principal investigator of its IAIMS grant.

While at the University of Wisconsin-Madison, he developed the nation's first Administrative Medicine Program, a Master's degree program for clinician-executives. As a surgeon, he was instrumental in the adoption and development of ambulatory surgery in the early 1970s and was team physician for the Wisconsin Badgers for ten years while also serving as President of the Medical Staff. He won a UW-Madison Chancellor's Distinguished Teaching Award.

His education includes a medical degree from the University of Kansas with subsequent training at the National Institutes of Health, the Johns Hopkins Hospital, Duke University Medical Center, the Institute of Medicine, and Harvard Business School. His MA is from the University of Cambridge. Don's research interests include national health information policy, quality improvement, administrative medicine, compartment syndromes, and management of academic health centers. He has written and edited a number of research articles, books, book chapters, and monographs on these topics. His avocations include enjoying his grandchildren, horse riding, fly-fishing, reading biographies, and various crafts. His coordinates are 301 657-1291, fax 301 657-1296, and e-mails - detmer@amia.org or detmer@virginia.edu.

Hamish S F Fraser, MBChB, MRCP, MSc is an Assistant Professor of Medicine at Harvard Medical School and Associate Physician at the Brigham and Womens Hospital. As the director of Informatics and Telemedicine at Partners In Health he directs the development of web-based medical record systems and data analysis tools to support the treatment of drug resistant Tuberculosis and HIV in Peru, Haiti, Rwanda, Lesotho, Malawi and the Philippines.

The PIH-EMR system developed by his team currently supports the management and monitoring of over 6500 patients in treatment in for MDR-TB Peru to date, and 1000 in the Philippines. His team have developed analysis tools for clinical and bacteriology data for these patients and to track the use of medication and predict future medication requirement, the largest single cost of the treatment project. The system provides tools to manage clinical data and digital images of X-rays. Dr Fraser has performed clinical evaluation studies of the system, including the impact of medication order entry by nurses on data quality, and has shown a significant reduction of medication errors with this approach. Further evaluation studies are underway along with his PhD student Joaquin Blaya looking at improving access to critical laboratory data. Dr Fraser has also led the development of a Web based medical record system to support the treatment of HIV patients in rural Haiti. The system has been operational for over 4 years and collecting data in very remote sites via satellite link with almost 11,000 records entered to date. Warning emails are generated nightly for low CD4 counts. The system includes a component that tracks all medications used by the nine ZL/PIH clinics in Haiti, managing almost 1.8 Million patient visits in 2006.

This EMR system has recently been redesigned as part of an international collaboration to develop flexible, open source medical record systems in developing countries, the OpenMRS project of which Dr Fraser is a co-founder. The first version of the OpenMRS architecture went live in February 2006 (in Kenya) and in Rwanda in August 2006. This project is now a large international collaboration, with over 140 people attending the developers and implementer meeting in Capetown in April 2007. The OpenMRS system has been released as an open source project.

Charles P. Friedman is currently serving as Senior Advisor to the National Coordinator for Health Information Technology in the Office of the Secretary of Health and Human Services. In this capacity, he is participating as a member of the Office's leadership team in matters related to program planning, development, management and evaluation. He is also contributing informatics scientific expertise to initiatives underway in the Office's four directorates.

Prior to joining the Office of the Secretary, Dr. Friedman was Institute Associate Director for Research Informatics and Information Technology at the National Heart, Lung, and Blood Institute of the NIH. In this capacity, he directed a Center with approximately 90 informatics scientists and IT specialists—addressing all aspects of computing within the Institute—and functioned as the Institute's Chief Information Officer. Friedman first came to NIH in 2003, in the role of Senior Scholar at the National Library of Medicine, where he coordinated the Library's research program in bioinformatics, was the Library's informatics training officer, and served as NLM's representative to informatics programs in the NIH Roadmap. He also collaborated with the Robert Wood Johnson Foundation to develop a public-private partnership for training in Public Health Informatics.

From 1996 to 2003, Dr. Friedman was Professor and Associate Vice Chancellor for Biomedical Informatics at the University of Pittsburgh. At Pittsburgh, he established a health sciences-wide Center for Biomedical Informatics, which subsequently has become a formal academic department of the medical school, with collaborative relationships to all other schools. From 1977 to 1996, Dr. Friedman was at the University of North Carolina (UNC), where, at the time he left, he was Professor and Assistant Dean for Medical Education and Informatics. In 1985, he established the Laboratory for Computing and Cognition at UNC, and in 1992, started UNC's medical informatics training program.

Dr. Friedman's research focuses on how to build information technology resources and knowledge environments that make people better at what they do; and how to study the effects of these resources on health care, research, and education. He also studies organizational and cultural aspects of information technology development and deployment. Dr. Friedman has authored or co-authored over 150 articles in scientific journals. He is the author of a well-known textbook on methods for evaluating biomedical information resources. He is a past president of the American College of Medical Informatics and was the 2005 chair of the Annual Symposium of the American Medical Informatics Association. He currently serves as Associate Editor of the Journal of the American Medical Informatics Association. He holds bachelors and masters degrees in physics from the Massachusetts Institute of Technology, and a PhD in education from the University of North Carolina.

Tom Healy is Lead Program Manager in the External Research & Programs group at Microsoft Research. In this role, he, along with his staff, manage a portfolio of programs, including research university engagements in Latin America, the MIT iCampus research alliance, the Microsoft Research New Faculty Fellowship program, the annual Microsoft Research Faculty Summit, and the worldwide Digital Inclusion program. Tom has been at Microsoft Research for the past eight years. Previous to joining Microsoft Research, he worked in the computer industry for 25 years focusing on the role technology plays in education.

Tom Kanyok received his B.S. Pharmacy (1989) and his Pharm.D. (1990) at the University of Kentucky, College of Pharmacy and completed a research fellowship in infectious diseases (1990-1993) at the University of Illinois at Chicago, College of Pharmacy where he specialized in anti-mycobacterial drug discovery and development. His interests in anti-mycobacterial chemotherapy led him to take a

faculty position first at the University of Rhode Island, College of Pharmacy (1993-1994), and subsequently at the University of Illinois, College of Pharmacy (1994-1997). His involvement with the development of a compound with activity against both tuberculosis and visceral leishmaniasis led to a position at the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (WHO TDR) in Geneva, Switzerland (1997-2007). While at WHO TDR, he was responsible for the development of a number of compounds with activity against Malaria, Tuberculosis, and Visceral Leishmaniasis, two of which are registered and three of which are in Phase III of development. He was also responsible for developing WHO TDR's phase IV strategy for the public health marketing of anti-malarial drugs.

Tom Kanyok joined the Bill and Melinda Gates in February 2007 as a Senior Program Officer Field Studies in the Infectious Diseases Department of the Global Health Program and has a variety of responsibilities in late stage drug development including Malaria, Human African Trypanosomiasis and Visceral Leishmaniasis.

Scott J.N. McNabb, Ph.D., M.S. is a Distinguished Consultant and Director for the Division of Integrated Surveillance Systems and Services at the National Center for Public Health Informatics, Centers for Disease Control and Prevention (CDC) and an Adjunct Associate Professor for the Departments of Epidemiology and Global Health at the Rollins School of Public Health, Emory University.

Prior to joining the Epidemic Intelligence Service (EIS) in 1991 and serving a 2-year EIS residency in New Orleans, LA, Dr. McNabb worked for 13 years at the Oklahoma State Health Department. Since 1993, his professional efforts have been targeted to serve people in underdeveloped, international settings. Recently promoted to Distinguished Consultant and Director, Division of Integrated Surveillance Systems and Services in the National Center for Public Health Informatics at CDC, he also teaches at the Rollins School of Public Health, Emory University. Having mentored 17 students through their M.P.H. or Ph.D., plus 11 fellows through the CDC Public Health Prevention Specialists program, he holds joint appointments in the Departments of Epidemiology and Global Health. Nominated for the 2005 CDC Charles C. Shepard Award, he successfully completed the 2004 Senior Executive Services candidate development program and is certified by the Office of Personnel Management for the Senior Executive Services.

Dr. McNabb's research interests focus on improving the effectiveness and efficiency of public health monitoring (integrated surveillance), exploring solutions to improve the public's health using public health informatics, studying the molecular epidemiology of tuberculosis, and using empowerment and capacity development in international settings. He also works toward tuberculosis public health practice reform in the Caucasus region of the former Soviet Union.

Patrick O'Carroll, MD, MPH, FACPM, FACMI is a Rear Admiral and Assistant Surgeon General in the U.S. Public Health Service (USPHS), serving as the Regional Health Administrator (RHA) for USPHS Region X (Alaska, Idaho, Oregon, and Washington). As RHA, RADM O'Carroll serves as the region's principal federal public health physician and scientist representing the Assistant Secretary of Health and the U.S. Department of Health and Human Services (HHS). Specifically, RADM O'Carroll (a) serves as liaison to state public health directors and other senior health officials in the region; (b) seeks to maximize the effectiveness of federal population health investments in the region.; (c) manages regional programs and activities of the Office of Public Health and Science (OPHS) including those of the

Offices of Minority Health, Populations Affairs, and Women's Health; and (d) promotes regional all-hazards preparedness. He began this assignment in January 2003.

RADM O'Carroll received his medical degree and his Masters in Public Health from Johns Hopkins University in 1983. After training in family practice and preventive medicine, he joined CDC as an Epidemic Intelligence Service Officer. Initially assigned to work in the area of violence epidemiology, RADM O'Carroll later led the epidemiology research unit for the prevention of suicide and violence at CDC's National Center for Injury Prevention and Control. He was elected as a Fellow of the American College of Preventive Medicine in 1988.

In 1992, RADM O'Carroll began working in the field of public health informatics. He co-led the development of CDC WONDER (an innovative computer system providing global access to CDC's epidemiologic data) and was lead scientist on the CDC Prevention Guidelines Database project. RADM O'Carroll developed the nation's first training course and first (and only) textbook on public health informatics. As Associate Director for Health Informatics at CDC's Public Health Practice Program Office, he defined, developed and directed CDC's national Health Alert Network program. Under RADM O'Carroll's leadership, the Health Alert Network grew from an idea into a $50 million annual investment in national public health information and communications infrastructure, and became established as a critical component of the nation's defense against bioterrorism. He was elected as a Fellow of the American College of Medical Informatics in 2004.

During his 22 years with CDC and USPHS, as an epidemiologist, informaticist, program director and leader, RADM O'Carroll has worked in many subject areas on a great variety of health and policy challenges. These include immunization; chronic disease; maternal and child health; environmental health; infectious disease epidemic control; behavioral health; global health and disease surveillance; and bioterrorism preparedness. He has received numerous awards and other recognition for his work, including two Outstanding Service Medals. RADM O'Carroll holds Affiliate Professor appointments in the Departments of Epidemiology and Health Services at the University of Washington School of Public Health and Community Medicine, and is also Affiliate Professor in the Division of Biomedical and Health Informatics, University of Washington School of Medicine.

LTC Julie Pavlin is currently the director of the Department of Defense Global Emerging Infections System at the Armed Forces Research Institute of Medical Sciences in Bangkok, Thailand. She received her MD from Loyola University and her MPH from Harvard University and is board certified in General Preventive Medicine and Public Health. She received her PhD in Emerging Infectious Diseases at the Uniformed Services University of the Health Sciences. While stationed at the US Army Medical Research Institute of Infectious Diseases, she developed the first international satellite broadcasts on the recognition and medical management of biological casualties, and at the Walter Reed Army Institute of Research, she managed and helped develop the military's syndromic health surveillance system.

Carol Sibley, PhD, MS, MA earned her undergraduate degree in Biology from the University of Rochester in Rochester, NY and her Ph.D. in Biochemistry and Biophysics at the University of California in San Francisco in 1974. After working as a postdoc at Caltech in Pasadena, CA, she joined the Department of Genetics in the fall of 1976. Her work at UW has been augmented by two sabbaticals. She was a Fogarty International Fellow in 1984-85 at the Department of Molecular Biology

at the Free University of Brussels in Belgium and a visiting scientist at the Institute for Molecular Medicine in Oxford, England in 1992.

Elliot R. Siegel, Ph.D. is Associate Director for Health Information Programs Development at the National Library of Medicine (Bethesda, Maryland), a component of the National Institutes of Health, and the Department of Health and Human Services. He oversees NLM's offices of planning and evaluation; outreach development; and international programs. During his 30 year career at NLM, Dr. Siegel put in place the long range planning function that has strategically set the goals and priorities for NLM's research and service activities. Charting a Course for the 21st Century is the Library's newest 10-year Plan that was developed in 2006 on behalf of the NLM Board of Regents. Dr. Siegel also coordinates the NLM's nationwide outreach initiative for minority and underserved populations. Technology development has been a principal focus of these efforts. His team launched with University of Washington colleagues the Tribal Connections program to connect Alaska Native villages and American Indian reservations in the Pacific Northwest to the Internet and to accessible electronic health information resources that help reduce health disparities. A similar capacity development initiative, requiring a very different technology solution, was successfully undertaken with malaria research laboratories in Sub-Saharan Africa. Dr. Siegel's research interests include the creation of new methodologies and metrics that have been broadly applied to the evaluation of medical information systems and website performance. He is Editor-in-Chief of the journal Information Services and Use. Dr. Siegel was awarded a PhD in Communication research and an MA in Industrial-Social Psychology; both from Michigan State University. He is an elected fellow of the American College of Medical Informatics and the American Association for the Advancement of Science.

Dr. Sally Stansfield is the Executive Secretary of the Health Metrics Network (HMN), an innovative global partnership that is hosted by the World Health Organization in Geneva.. As the founding director of this initiative, Dr. Stansfield works to improve health and save lives by strengthening and aligning health information systems around the world. With her leadership, the HMN Secretariat coordinates the efforts of member countries, technical agencies, donors, and civil society groups that are committed to improving the availability and use of information for decision making.

Dr Stansfield, an expert in public health and the development of health information systems, has worked extensively in the field in Africa, Asia, Central and South America and the Middle East. For seven years prior to assuming the leadership of the HMN, she worked in the Global Health Program for the Bill & Melinda Gates Foundation. There, she was instrumental in creating and managing several landmark alliances including the Global Alliance for Vaccines and Immunization (GAVI), the Global Fund to fight Tuberculosis, AIDS and Malaria (GFATM), and the Global Alliance for Improved Nutrition (GAIN). She has worked in senior positions for Management Sciences for Health in Cambodia, the International Development Research Centre in Ottawa, the US Agency for International Development, and the US Centers for Disease Control and Prevention. Dr. Stansfield has also served in research and teaching roles on the faculties of Addis Ababa University, Ethiopia; McGill University in Montreal; Johns Hopkins University in Baltimore; the University of Washington in Seattle; and the Uniformed Services University of the Health Sciences in Bethesda, Maryland.

http://www.who.int/healthmetrics/en/.

Andy Stergachis, Ph.D., R.Ph., is Professor of Epidemiology and Global Health and Adjunct Professor of Pharmacy, and, effective 9/17/07, Associate Dean, School of Public Health and Community Medicine,

University of Washington. He served as the University of Washington's Interim Chairman of the Department of Pathobiology from 2004-2006 and Chairman of the Department of Pharmacy and Founding Director of the Program in Pharmaceutical Outcomes Research and Policy from 1992-1998. From 1998-2003, he was Vice President, Chief Pharmacist at drugstore.com, where he provided corporate leadership in defining and implementing innovative Web-based features to promote drug safety and improved consumer decision-making. Prior to 1992, he was with Group Health Cooperative of Puget Sound's Center for Health Studies, where he had progressive responsibilities in applied research and health information for the nation's largest consumer-governed health care system. He earned his pharmacy degree from Washington State University and his M.S. and Ph.D. in Social and Administrative Pharmacy from the University of Minnesota. Andy was the 1990 Burroughs Wellcome Scholar in Pharmacoepidemiology. The American Association of Pharmaceutical Research Scientists awarded Dr. Stergachis the 1994 Research Achievement Award in Economic, Marketing and Management Sciences. In 1999, he was selected as one of the 50 Most Influential Pharmacists in U.S., by American Druggist. He was awarded the American Pharmaceutical Association Foundation 2002 Pinnacle Award for career contributions towards improving quality of care through the medication use process. Dr. Stergachis serves as board member for the American Pharmacists Association Foundation and he is a Fellow in the International Society for Pharmacoepidemiology. He has published over 100 peer-reviewed manuscripts or book chapters, including research in the prevention of pelvic inflammatory disease that helped lead to new recommendations from the CDC and the HEDIS measure, "Chlamydia Screening in Women." He was consultant to United HealthCare for its pharmacoepidemiology cooperative agreement with the Food and Drug Administration. In 2006 he was awarded a pilot project grant from the Puget Sound Partners for Global Health to study pharmacovigilance models for pregnancy malaria in Sub-Saharan Africa and spent a sabbatical with the Infectious Diseases Institute, Makerere University, Kampala, Uganda, where he serves as a visiting professor. Other international responsibilities include service as a temporary Advisor, Informal Consultation on the Clinical Role of Artemisinins in Pregnancy for the World Health Organization, and consultant on Public Health Aspects of Mass Gatherings, WHO-Regional Office for Europe. Dr. Stergachis has served on NIH's Epidemiology and Disease Control Study Section, AHRQ's Health Systems Research Study Section, committees of the National Committee on Quality Assurance, the Institute of Medicine's Committee on Poison Prevention and Control, the Institute of Medicine's Committee to Study the Interactions of Drugs, Biologics, & Chemicals in U.S. Military, and the Institute of Medicine's Committee on the Assessment of the U.S. Drug Safety System.

Poster Abstracts

In the Cove Room

#1: Grid Technology for Global Public Health Monitoring

Authors: *Gianluca De Leo, PhD (1) Cynthia LeRouge, PhD (2) Marco Fato, PhD (3) (1) Old Dominion University, Norfolk, VA, USA (2) Decision Sciences/ MIS Department, Saint Louis University, Saint Louis, MO, USA (3) Department of Communication, Computer and System Science, University of Genoa, Genoa, Italy*

Abstract: New effective approaches that provide real time global public health information are needed to better respond to emerging health risks around the world, disease outbreaks, bio-terrorism attacks and global infectious. Early discovery of public health outbreaks is a key point in controlling and managing the spread of diseases and in organizing public health interventions. We propose to design a system based on grid technology able to collect worldwide data in real time related to 1) emergency room diagnosis, 2) and drugs selling patters in pharmacies. Grid technology is a special form of parallel computing, which harnesses the collective power of low-cost commodity hardware through the Internet to produce computing resources of supercomputer power. Grid technology offers access to distributed data in a secure, efficient, transparent and robust way. The system proposed would be able to detect an atypical consumption of a specific drug or an abnormal show rate for a specific disease at emergency rooms on a "real-time" basis potentially anywhere in the world. This system could also be used at regional and national level. Participatory limitations include the need for: 1) access to internet-based network infrastructures, 2) national/international policy for sharing data among institutions, 3) sharing privileges with data already present at the different information system at hospitals and pharmacies

#2: Using smart phones as multimedia device for increasing diabetes education and health interventions among population and practitioners in Ghana

Authors: *Cynthia LeRouge PhD (1), Gianluca De Leo PhD (2), Obeng Busia (3), Henri K. Parson, PhD (4), Rexford Anson-Dwamena (4), Etta J. Vinik M.A.(4), Aaron I. Vinik MD PhD (4), Fred Dwamena (5), Matthew Guah, PhD (6), Nana Kwesi Arhin (7) (1) Decision Sciences/ MIS Department, Saint Louis University, Saint Louis, MO, USA (2) Virginia Modeling Analysis and Simulation Center, Old Dominion University, Norfolk, VA, USA (3) The Counselor General, Ghana Embassy, New York (4) The Strelitz Diabetes Institutes, Eastern Virginia Medical School, Norfolk, VA, USA (5) Ghana Embassy, New York (6) Erasmus School of Accounting & Assurance, Erasmus University Rotterdam, The Netherlands (7) Ghana Rep. at United Nations*

Abstract: Seven out of ten countries with the highest number of people living with diabetes are in the developing world. The World Health Organization predicts that developing countries will account for 80% of all new cases of diabetes. Ghana is one of these countries where diabetes is a major cause of adult disability and death. Recent studies attribute the burden of diabetes to poor patient practices and limited knowledge of the clinical complexities of diabetes. Moreover, diabetics who live in rural areas of developing countries are often seen and treated at facilities with no trained diabetes healthcare personnel. Ghana is experiencing a proliferation of mobile phone usage through shared access as well as an individual basis. In areas with limited telecommunications infrastructure, smart phones provide promise for e-health options by transferring most of the processing- intensive tasks (e.g., database storage and retrieval) to remote servers. Most of the rural areas in Ghana have electricity but lack telecommunications infrastructure. In cases of limited infrastructure, smart phones may still be used as educational tools through the use of multimedia presentations such as virtual reality animation,

graphics videos, movies and audio clips. This project proposes the use of smart phone as a multimedia device, rather than a telecommunication device, to provide 1) a learning daily experience to people with diabetes and/or at risk of diabetes, 2) a knowledge repository and disease management tool for health providers. A virtual doctor would allow users to navigate and to interact with the tool in real time.

#3: Integrating Knowledge from Research and Practice: The Cuban Experience

Author: *Ann Séror*

Abstract: The Cuban Health Care Network and Portal – Infomed[1] – demonstrates a unique approach to integration of scientific research with expert intervention in evidence-based medicine. This presentation examines how such integration is designed in the web-based services and databases available through Infomed. Among the institutions linked to Infomed, the Cuban Virtual Library contains a growing collection of open access Cuban medical journals in Spanish language freely available to researchers as well as health care service providers. The Virtual Library also offers access to extensive regional databases such as SciELO, the Scientific Electronic Library Online, including searchable resources organized by country of origin as well as by subject.[2] While published scientific research forms the foundation for evidence-based medicine, Infomed further recognizes the critical role of communities of practice and expert intervention in supporting evidence-based practice. National networks for communities of practice include paediatric surgery, rehabilitation medicine, neurology, traditional medicine, urology and rheumatology. The first such infrastructure was the Cuban Paediatric Surgery National Network (Red Nacional de Cirugía Pediátrica –Renacip) created in 2001. [3] [4] The objectives of these networks include identification of regional and local collaborating experts, definition of best practice protocols, diffusion of high quality research results for evidence-based medical practice, and linkage of the resources of all participating health care institutions. [5] One of the most distinctive features of this system is the role of human resources in a matrix of national networks focused on processes of research, learning and health care service. This matrix design has contributed to interdisciplinary integration of the activities of diverse health care actors in communities of practice extending across the country. References 1. See http://www.sld.cu 2. See http://www.scielo.org 3. Trinchet Soler RM, Pedrianes Vigo M. Origen, Estado Actual y Perspectivas de la Red Nacional de Cirugía Pediátrica. Acimed 2004;12(3). http://bvs.sld.cu/revistas/aci/vol12_3_04/aci11304.htm. 4. See the Renacip Portal at http://www.sld.cu/sitios/renacip/ 5. Trinchet Soler RM. El Éxito de Una Red. Acimed 2006;14(3). http://bvs.sld.cu/revistas/aci/vol14_3_06/aci16306.htm.

#4: Epi-maps and web mashups for obesity surveillance

Authors: *Paul Jarvis, Colin Venters, Sarah Thew, Alistair Sutcliffe, Iain Buchan*

Abstract: The increase in obesity over the past 20 years has become an international public health crisis. The lack of timely, accurate information led to a six year delay in recognizing the obesity epidemic in UK children, in spite of height and weight measurements of children at various ages being routinely collected for many years. Chaining data, analytical methods and public health professionals into an intelligence workflow is fragmented. The fragmentation leads to delayed or lost intelligence. Decision-makers have little control of the underlying systems to produce the intelligence they need. Public health intelligence in the very complex area of obesity needs to be agile, and user-driven. Our research focuses on the development of an obesity intelligence system as a collection of web services and tools encapsulated within an epidemiological workflow. The combination of analytical web services

and interactive visualization tools will allow public health professionals to produce the intelligence they require to set future policy. Output will include interactive and reusable objects such as statistical reports, charts, graphs, and the visualization of spatial and temporo-spatial patterns from geo-coded health records. Collaboration with the Association of Greater Manchester Primary Care Trusts and other agencies is allowing us to develop knowledge about data standards and quality allowing us to create ˜mashable" services for global applications. The workflow is currently under development at the University of Manchester as part of the Health Intelligence for Greater Manchester Obesity (HIGMO) and the Adaptive Visualization Tools for e-Science Collaboration (ADVISES) projects.

#5: Serum cholesterol and survival from acute inflammatory stress: African cows and UK citizens?

Authors: *Paul Dark, Andy Brass, Geoff Warhurst, Pat Baker, John New, Martin Gibson, Aram Rudenski, Steve Kemp, Iain Buchan*

Abstract: Hypothesis: Low and falling serum cholesterol is an independent risk factor for death during human critical illness. Origins: In omic studies with models of African cattle trypanosomiasis, we have discovered important links between low cholesterol biosynthesis and susceptibility to infection, acute inflammation and death. In order to explore whether or not similar associations exist in humans, we chose intensive care as a setting for the study of people under severe inflammatory challenge. Design: Case cohort study. Setting and population: All patients admitted to the Intensive Care Unit at Salford Royal Hospitals NHS Foundation Trust between April 2006 and January 2007. Methods: Biochemistry data, which are routinely added to the patient's health e-record, were extracted from the hospital's clinical information system. Records were linked to an administrative database to determine whether or not each patient was living or dead 28 days after the date of admission to the intensive care unit. Tables of data were constructed for statistical analysis using Microsoft SQL server as the database. The data were summarized in tables, charts and descriptive summary statistics prior to univariate analysis and model building. Findings: In a cohort of 607 patients, we discovered that an early, sustained pattern of falling total serum total cholesterol is a strong independent predictor of 28 day mortality. By implication, a switch to a recovery profile of total serum cholesterol by day ICU day 3 is associated with survival advantage. Dissection of these patterns into HDL- and non-HDL cholesterol responses suggested that a mortality susceptibility signal is associated with non-HDL cholesterol (forward cholesterol transportation). Discussion: Our clinical observations add understanding to the links between lipid metabolism and host responses to severe tissue injury and infection. Furthermore, our study develops the concept that cholesterol may be protective during acute severe illnesses in human and veterinary medicine worldwide.

#6: NW e-Health (UK): a confederation of BioHealth e-Laboratories in the NorthWest region of the United Kingdom

Authors: *Northwest Institute for BioHealth Informatics, University of Manchester, U.K.*

Abstract: NW e-Health (UK): a confederation of BioHealth e-Laboratories in the NorthWest region of the United Kingdom. Northwest England encompasses a set of sub-populations with a variety of health-related issues, with characteristics that potentially enable high value social and biohealth epidemiological research. This potential is currently under-exploited due to overall lack of 'integration' between the sub-regions. Nevertheless, a number of individual NHS Trusts within the region already practice EHR aggregation and analysis to support service development and commissioning; a notable example is the Salford ETHOS project – the result of an effective partnership between the University

of Manchester and Salford NHS Primary Care and Foundation Trusts. Building on the opportunities and learning from ETHOS, regional and national funding agencies are now working with Manchester University, local NHS Trusts and industrial partners to establish 'NW e-Health' to integrate and process regional NHS data to provide research outputs to support a wide range of needs for local healthcare service provision, biomedical discovery and product development. This 'BioHealth e-Laboratory' and the emerging 'research object' paradigm for data management enable high value analysis and interpretation, whilst ensuring the governance and security of patient information, providing a highly responsive e-infrastructure and community of practice to grow research activity at the clinical front line.

#7: Knowledge Management for Federated Social Bio-Health Research

Authors: *Jiten Bhagat, Iain Buchan*

Abstract: Effective management of knowledge is a key factor to the success of projects within any research field, but especially in Social Bio-Health Informatics. From the scientific experimentation phase right up to publishing, knowledge is produced, transferred, shared, manipulated, and exposed. We propose a new model to support this lifecycle – Research Objects (ROs), to address the issues of manageability, reproducibility, ownership, exposure, and sharing. This model primarily focuses on exposing research outputs and managing data assets. ROs are containers that encapsulate the outputs of a project together with all the associated files, data objects, properties, meta-data, annotations, behaviour, events, relationships, workflows and protocols required to derive the outputs. Assets encapsulate specific files and data objects in ROs and have associated meta-data that describes their role, type and properties. They can be extended with custom actions, visualisers and processes. Whilst ROs are self-contained they allow data from external sources to be linked in, maintaining original ownership and authority. The proposed model is geared towards open standards and generic structures, allowing knowledge to be easily transferred and federated. ROs put data into clear research contexts, thereby promoting local ownership and making research more transparent and manageable. ROs provide a consistent method for managing knowledge without being overly restrictive. Furthermore, the object-centric approach allows social networking features to be added. For example, tagging and commenting of assets and ROs can enhance the way people collaborate and promote better communications between researchers.

#8: Shared Genomics - Accessible HPC for Medical Genomic Research

Authors: *David Hoyle, Iain Buchan, Peter Crowther*

Abstract: Microarray technology for genome-wide SNP genotyping has provided a unique opportunity to study common complex diseases through case-control studies. This opportunity also presents computational and knowledge management challenges – the statistical analysis and search for SNP interactions presents a major computational bottleneck in processing the raw data, motivating the need for a High Performance Computing (HPC) based solution. Statistical analysis of the raw data produces an equally large volume of derived data. Making sense of this derived data requires integrating the statistical analyses with information already known to the wider research community, such as SNP location, gene function, gene regulation, relevant biochemical pathways etc. This community knowledge exists in the form of individual expertise of scientists and information deposited in distributed databases and knowledge repositories. Intuitive and easy access to both HPC infrastructure and community research knowledge will be crucial for optimizing new research findings from genome-wide SNP case-control studies. At NIBHI we have begun to develop, in collaboration with Microsoft, the

necessary HPC infrastructure. The HPC facility will be accessed via a portal site, providing a shared environment through which collaborating scientists exchange results, analyses, comments and documents. Running the statistical analyses on the HPC infrastructure is executed by initiating workflows from the portal site. Automatic retrieval of annotation data from many distributed sources can also be performed through integration with existing bioinformatics workflow enactment systems, such as Taverna. In this poster we present findings from our initial experience of developing this 'Shared Genomics' infrastructure.

#9: HIV and STD web based distance learning platform

Authors: *Peinado Jesus, Sanchez Jorge, Campos Pablo*

Abstract: Background: To prevent AIDS and STD transmission in HIV positive patients by increasing HIV care, equity and respect to human rights in health workers from the Ministry of Health (moH) from Peru, the Global Fund ask for a flexible platform of distance learning that can be a supplemental resource for traditional training. Methodology: We used ASP.Net to develop a web based distance platform (SISCLASS), as well as objects from MS-SQL such as triggers, functions and stored procedures. UML was used to modeling, designing, and validation. We introduce here a novel, learning-based algorithm to create adaptive and random questions; the algorithm decides which questions you see based on your performance earlier in the section. In the same sense, it was built to be administrable at minimum. Results: SISCLASS is a platform that permits authoring classes, questions and answers; organization in three levels: course, chapters and themes, development of difficulty levels and random questions to create customized and adaptive track of courses and questions. SISCLASS delivers answers and certificate in real time, and was tested in five cities across Peru. This web based system was offered to 300 health workers as a supplemental resource but because it is an open training resource, currently it has enrolled more than 3,000 participants in its nine core courses. Conclusions: A distance learning platform has been built to training health workers in AIDS and STD transmission because of its usability and flexibility ten times of its target population are using this platform in Peru.

#10: Building a web based platform for a HIV Latin American repository database

Authors: *Peinado Jesus, Sanchez Jorge, Salazar Raul, Paredes Andres, Suarez Luis*

Abstract: Background: Novel HIV-related research questions require large databases, usually comprising multiple countries. As a first step to build a Latin American-SIDA database (LASIDA), we develop a regional data center to integrate and harmonized HIV information from different HIV care sites. This development needed an informatics solution that can integrate and harmonized data bases from different LA countries Methodology: In 2004, we developed web based platform software (SISCLIN) using ASP.Net language program, and objects from MS-SQL such as triggers, functions and stored procedures. We used UML and Rational Unified Processing to model, design, and validate SISCLIN. Questionnaires were developed by the LASIDA group to collect retrospective data since 2002, in four different countries. SISCLIN was designed to fulfill data management principles and CRF21 part 11 and was tested at 2 large hospitals at Lima Peru. Results: SISCLIN performs web data capture, auditing, and integration by providing automatic quality control checking, branching and skipping questions organization and data base harmonization. A unique patient identification code is used as a core link for clinical, laboratory, treatment and pharmacy data. This software is currently used to collect HIV data from Peruvian hospital and clinical research sites, reporting new HIV cases to the Epidemiology General Direction. SISCLIN is ongoing implementation in Mexico, Brazil and

Argentina. Conclusions: A Latin American integrated repository database is been built to answer regional operational and clinical research questions to provide guidance in regional treatment policies. A second phase to integrate prospective data is in planning stages.

#11: Web based clinic information system to manage clinic research operations

Authors: *Peinado Jesus, Sanchez Jorge, Campos Pablo E, Casapia Martin, Ortiz Abner, Montoya Orlando*

Abstract: Background: Reliable clinic operational data is required for good clinical research results. Optimization data monitoring of clinic processing is essential to reduce wasting time and burden to clinical research staff. There is no commercial software that provides clinic operational study reports including site/patient/visit tracking, drug and dose treatment regimens, scheduling for screening and enrollment that complies with 21 CFR Part 11. Methodology: In 2003, we developed the Clinic Information System (CLIS) software using ASP version 3.0, ASP.Net, Javascript, and objects from MS-SQL such as triggers, functions and stored procedures. We used UML to model, design, test and document the software. It was tested under NIH funded protocols at 5 clinic research sites (CRS) at the IMPACTA Clinical Trial Unit (CTU). CLIS was built totally under NIH and FDA standards, SOPs regulations and Data Management Principles. Results: CLIS provides centralized basic clinic information and patient schedule management to more than 20 NIH funded protocols in nine CRS across Peru and Ecuador. This database integration capacity for the Peruvian CTU has permitted to recruit thousands of participant yearly maintaining security, reliability and confidentiality by e-mail alerts to recruitment and retention staff when patients missed their visits. Conclusions: This software clearly has improved and enhanced efficiency of HIV and STD clinical research and has contributed to high rates of participant retention and adherence. The software being translated into English and Portuguese and will be tested in the US and Brazil for further global implementation in HIV Vaccine Trial Network sites.

#12: Information Infrastructure for Health Knowledge Management in Developing Countries

Authors: *Sridhar Papagari Sangareddy, PhD Candidate, Department of Information and Decision Sciences, University of Illinois at Chicago; Dennis Cesarotti, PhD, Assistant Professor, Northern Illinois University, DeKalb, Illinois*

Abstract: Information Infrastructure for Health Knowledge Management in Developing Countries In order to optimize the benefits of investments in health education and improve the health status of their citizens it is important for the policy makers in developing countries to effectively employ ICT infrastructure for health services delivery, population health promotion and capacity building in both the rural and urban centers. We are proposing the development of a Pan African Health Information Infrastructure (PAHII) that will capture and communicate health services and population health knowledge to stakeholders when and where needed in order to improve decision making and health status of patients and populations. Other major features of PAHII are public health informatics capacity building and collaborative health solutions development. PAHII will leverage the existing online public health informatics program at the University of Illinois at Chicago, the health informatics programs in South Africa, Ghana, and the African Health Informatics Association to develop health capacity in Africa. The collaborative health solutions feature uses Web 2.0 technologies to foster online working relationships between healthcare professionals in Africa and their colleagues in the Diaspora. Research shows that over 60% of African physicians in USA are willing to contribute to the development of healthcare capacity building in their respective home countries. PAHII will improve the transfer of health knowledge from African experts in the Diaspora to their colleagues in Africa. The collaborative

health solutions feature is currently being tested in a few African countries and pilot results will be presented at this conference.

#13: Shared framework architecture for developing data management systems for developing countries - 'SAFE an example'

Authors: *S Pujari 1 , L Rosencrans 1 , J Ma1 , R Mir 1 , M Otten1 , A Patel1, J Kadjo1*

Abstract: Background: Changes in health care are at a breakneck pace. Delivering healthcare is an enormously information-intensive process. Whether caring for a patient or a population, we are in a knowledge exchange business. For effective health care the Knowledge exchange has to be fast and understandable.

Objective: To show the strength of standard development frameworks in helping build robust and effective information systems particularly in low resource settings.

Challenge: Information Architecture is a systematic, planned approach to building enterprise-wide information systems. The term refers not only to the use of information technology, but also to the totality of the data, processes, and technology used in a given enterprise and the relation between them.

The challenge is to identify an architecture that is

Scope independent, Adaptable and easy to use and , Cost and Resource optimal.

Method : The needs can be addressed by standardized architectures like SAFE (Structured Applications Framework for Epi Info) that utilizes Public Health databases and constructs a repository for sharing development modules that are menu driven and easily customizable and which facilitate visual and GIS representation of the information. The framework facilitates development of simple outbreak response systems to Country level Health Information Management systems by defining protocols for development built on accepted development practices.

SAFE as a framework has protocols for variable and file naming conventions, shared file usage, process call procedures, file structure etc. thus providing , ease of adaptability by abiding to simple rules. This facilitates faster development, easy modification and maintenance, optimal production and output in resource poor settings.

Illustrations: SAFE has been the modeling framework for various data management systems ranging from aggregate databases such as RI coverage, logistics , New vaccines surveillance, to Measles LIS, IDS, PMTCT ,VCT (Voluntary Counseling and Testing),ART (AntiretroviralTherapy), TB to Case based Measles Surveillance Systems, AFP Surveillance Systems. SAFE based systems are being successfully and widely used over time in various countries mainly in African and Southeast Asian regions of WHO which have strong resource challenges.

Future work: The SAFE framework currently applies only to EPIInfo based application development, the future work entails creating an application independent framework and have a repository of certified working framework.

#14: e-Infrastructure for cohort studies and trials

Authors: *John Ainsworth, Robert Harper, Lucy Bridges, Pauline Whelan, William Vance*

Abstract: The core tasks in a cohort study or clinical trial are hypothesis generation, study design, data collection, data linkage, data analysis and publication. The benefits of using information technology to

support these tasks are well understood and yet there are barriers that prevent it being used. Even where information technology is used to support individual tasks in the study cycle, the interfaces between the tasks are typically ad-hoc relying on manual intervention. The philosophy behind the PsyGrid project is to eliminate the barriers through the development of high quality, usable, open source software tool kit that allows knowledge and data to flow automatically from one task to the next, to provide 'round-trip' study management. Our initial goal was the development of a toolkit where multi-centre studies and trials can be designed, implemented, managed and closed by the clinical researchers, resulting in the PsyGrid CoCoA system, which has been successfully used in mental health research. In the current phase of the project we are developing tools for automating data linkage and managing data analysis that operate across the academic and health care boundary. We propose a federated, data grid architecture that incorporates local data governance policies, respects the subject's given consent and maintains patient confidentiality. The output will be an archive containing the source data, the results and the generated provenance data which enables results to be easily shared and reproduced.

#15: The Implementation of a National Pediatric Neurology Disease Database in the Bahamas

Authors: *Lynette Colaco, Edwin Demeritte*

Abstract: The Neurodevelopmental Clinic is an outpatient government sponsored early childhood intervention centre that offers developmental surveillance from birth to 5 years and 5 therapies (Physical Therapy, Occupational Therapy, Infant Stimulation, and Psychology) for children up till the age of 8. It is one of four units of the department of pediatrics in the local public hospital but is located away from the hospital compound. Because the hospital also currently employs the only pediatric neurologist in the entire country, the majority of pediatric neurology cases are seen at any of these units. Establishing a database will capture data between all four units and will function as a national disease registry for all childhood neurological disorders. Prevalence estimates using capture recapture techniques will be facilitated by this and ultimately assist with other such epidemiological studies. Assessments of health trends, monitoring of effectiveness, evaluation of interventions and identifying possible at risk groups become necessary components of the provision of adequate local pediatric neurology services. This project describes the implementation of a pediatric neurology database as the country moves towards a population health information system.

In the Marina Room

#16: Enhancing regional and local capacities through the development of the Central American Network for Disaster and Health information (CANDHI)

Authors: *Victor H. Cid (NLM) ; John C. Scott (Center for Public Services Communication), Ricardo Perez (Pan American Health Organization); Dave Zervaas (UN International Strategy for Disaster Reduction)*

Abstract: The Central American Network for Disaster and Health Information (CANDHI) is a group of public health, medical and disaster libraries working together to enhance information management capacities with a goal of contributing to disaster preparedness (http://www.candhi.org). Following hurricane Mitch in 1998 and two earthquakes in El Salvador in 2001, it was apparent that radical changes were needed to improve national capacities in disaster preparedness, mitigation and response. Access to relevant and reliable information was a must for all of these activities. In 2001, NLM, PAHO, and the UN International Strategy for Disaster Reduction sought to strengthen the health information infrastructure in Central America by providing financial and technical support to the Regional Disaster Information Center for Latin America and the Caribbean (Spanish acronym CRID) to help countries collect, organize, and disseminate information on disasters. The program created ten disaster health information centers in medical libraries and disaster-related organizations in six countries, now connected as the CANDHI network. The centers now have the skills and resources to organize and disseminate information including technological infrastructure, information management techniques, and product development experience (digital libraries, web sites). The network supports a digital library of over 12,000 full-text grey literature documents on disasters, available for free on the web. For 6 years, CANDHI has helped build institutional capacities to facilitate disaster preparedness activities. Based on the CANDHI experience and the increased demand for disaster information, South American countries are developing a similar network and plans for a Southeast Asia disaster information network are underway.

#17: National Center for Disaster Information

Authors: *Steven J. Phillips, MD*

Abstract: The National Library of Medicine (NLM) is developing a National Center for Disaster Information to ensure the effective use of libraries as major and untapped resources in the nation's disaster management efforts. This Center will be the natural evolution of NLM's historically strong commitment to the collection, organization, and dissemination of health information and will be part of the federal effort to help prepare, respond, and reduce the adverse health effects of disasters in partnership with federal, state, and local communities. "Disaster" includes public health emergencies, man-made disasters, and natural disasters such as pandemic influenza and catastrophic seismic and meteorological events. The Center's informatics agenda will identify health topics and information resources essential for all-hazards preparedness, response, and recovery. Several activities under development include the creation of Emergency Information Centers within the National Network of Libraries of Medicine (a network of nearly 6,000 libraries) to work in conjunction with Emergency Operation Centers; training and continuing education programs; database of published and grey literature in disasters, Web 2.0, syndromic and other surveillance research and communication interoperability technologies to support Continuity of Operations programs. NLM has a long history of providing health information in times of disaster and several of NLM's information tools are designed for use in disaster situations. These include the Wireless Information System for Emergency

Responders (WISER), Radiation Event Medical Management system (REMM), Influenza Virus Resource with the National Institute of Allergy and Infectious Diseases and a software package to help identify 9/11 victims' remains via DNA.

#18: Managing the Knowledge in a Systematic Review

Authors: *Mellanye Lackey*

Abstract: OBJECTIVE: To offer a methodology for teaching students to search databases and organizing results to report search strategies in systematic reviews. METHODS: The researcher, an academic health sciences librarian serving a public health school, advises PhD and Masters students conducting systematic reviews. The researcher finds students need instruction and information management tools to handle the complexities of performing systematic reviews in public health. Process recommendations include: Build initial search strategy in facets: Dividing complex questions into separate facets allows for easier comprehension of the search process. Students group facets of text word synonyms and index terms. The grouping allows for translating the search strategy for each database. Identify and track resources: The interdisciplinary nature of Public Health necessitates searching a variety of databases covering healthcare, education, or psychology. Other relevant information sources include conference proceedings, grey literature, bibliographies of hallmark works and collegial contacts. Manage knowledge: The researcher instructs students to track essential information in report methods- the name of the database, database vendor, coverage dates, dates searches are conducted, search strategies used for each database, and number of results retrieved. Students are taught to import citations into a citation manager, then export them into a spreadsheet where the 'sort' function facilitates annotation, organization and knowledge management. CONCLUSION: Students benefit from structured database instruction and from applying information management techniques and tools to track accurate reporting in systematic reviews.

#19: You call this vital? Collecting and Analyzing Data to Influence Public Health Policy and Improve People's Quality of Life

Author: *Philip D Walker*

Abstract: Rural areas of the industrialized world as well as developing countries, in general, face health crises. These crises may be endemic or epidemic, environmental hazards, chronic or communicable diseases, man-made or natural disasters.

Regardless of how one's health is being affected, it has been shown in numerous articles and programs that health-related data can be used to respond to disasters more efficiently and effectively, reduce morbidity and mortality, influence public health policy, allow for baseline parameters to judge the effectiveness of programs, and better allocate governmental or philanthropic funds. This poster will examine the arguments for standard data collection requirements while providing several examples from around the world on how public health practitioners have taken their information needs and combined ingenuity and, in some cases, technology to better the lives of those they serve.

#20: Who Is Sick? User Generated and Geo-Coded Illness Tracking

Authors: *PT Lee, Tony Hawksworth, Ben Tao, Rajiv Dulepet, Eric Lai*

Abstract: The WhoIsSick.org website monitors and tracks commonly occurring illnesses based on geographic location by allowing individual users to enter their own symptoms into a simple graphical interface. By pooling individual users' data together, one can view a "sickness" snapshot in a particular

location of interest. Currently, there is no publicly available source that allows people to view individual morbidity information based on a specific geographic location. The Center for Disease Control does allow users to view numbers of specific illnesses, for example the number of cases of flu reported, however it only reports numbers based on each state. Further scrutiny of those numbers is not possible. WhoIsSick.org addresses this problem by using a simple user interface to allow the general population to enter their symptoms, combining it with the popular Google Maps interface along with detailed analytics of the actual morbidity data. The result is a map of different users and their symptoms, which is marked by their zip code. As the website grows in popularity the number of illnesses reported will increase, and thus offer the general user information relevant to their needs. In addition, the ramifications for the scientific and medical community are a real time constant flow of morbidity information that could be used for syndromic surveillance and to better understand infectious disease epidemiology. Collaborations with research partners are underway to utilize this flow of real-time information.

#21: Improvement of Diagnostic Performance in Indian General Practitioners Using NxOpinion

Authors: *Joel Robertson, PhD, Robertson Research Institute, Saginaw, MI (RRI), Del J. DeHart, MD, FACP, (RRI), Ramakrishnayya Gadam, MD, FACP, St. Mary's of Michigan, Saginaw, MI, Professor D. Prasada Rao, Director, Nizam's Institute of Medical Science, Hyderabad, India (NIMS), and M.U.R. Naidu, Dean, NIMS.*

Abstract: NxOpinion is a medical software suite which includes diagnostic software built upon a Bayesian inference engine. In independent testing, NxOpinion eclipsed other diagnostic software based on standardized case testing and in reference to textbook presentations. The purpose of our study was to examine the ability of NxOpinion to improve the diagnostic performance of general practitioners in real time clinical encounters with patients presenting with gastrointestinal complaints in an underserved population in India. Nizam's Institute of Medical Sciences is located in Andhra Pradesh Province in India, and provides outpatient clinical services to 20,000 patients each month as part of its broader teaching and training clinical program. We performed a case-crossover study of 200 patients presenting with gastrointestinal complaints. Patients were initially seen by one of the participating clinicians and then by another clinician using NxOpinion. Diagnostic results were compared to the diagnosis of a specialist in gastroenterology. General practice clinicians improved diagnostic performance using NxOpinion in this clinical setting. In this case-crossover study of an unselected cohort of patients presenting with gastrointestinal complaints to a general medical clinic for the underserved, general practitioners improved diagnostic accuracy over time when using NxOpinion, as compared to a final diagnosis reached by a blinded specialist in gastroenterology. NxOpinion demonstrates the potential value of accurate and accessible medical diagnostic software in resource-poor settings, and when coupled with a simple electronic health record could provide significant improvement in medical care and resource utilization.

#22: "You can't always get what you want, but...": Events, signs and history as predictors of diabetes complications

Authors: *Andrew J Brunskill MB, MPH, Gayle Reiber PhD, Ruth Etzioni PhD, Andrew J Karter PhD , Kenric Hammond MD*

Abstract: Introduction – Models which predict the risk of developing diabetes complications may allow better allocation of health resources. However some of the present models have problems. These include using newly incident cases and requiring laboratory or other data which may be missing or

unavailable. Previous research suggests that early diabetic events and their rate of onset are valuable predictors for later events. In calculating rate of progression of complications, duration and other variables may be missing. Imputation methods based on available data and prior knowledge may help mitigate this.

This research study tests whether restricted models might offer equivalent prediction of selected diabetes complications to extended models which include lab values. We also test the value of event-based and imputed duration models.

Methods: Examples of models which did and did not include laboratory results were computed and compared with and without imputed duration variables in a VA data set.

Results and Conclusion: Using event data, signs and imputed diabetes duration may allow the prediction of future risk of serious complications at a level comparable to that achieved by models using laboratory data.

Assessment and Discussion: Better modeling of available data, including data which is presently available but neglected, may allow for predictive models that do not necessitate use of laboratory results. This has implications for the choice, collection, analysis and efficient and effective use of health data in both developed and developing data settings. Laboratory results, while valuable, may not be critical for modeling or useful resource allocation in diabetes.

#23: Globalization and Health: Defining the Risks and Opportunities for Global Health

Authors: *Sara Curran, PhD and Ann Marie Kimball, MD, MPH*

Abstract: Background: The global diffusion of disease follows international travel and trade routes, creating new risks to populations. Policy makers need the best maps of interconnections and vulnerable populations to effectively respond in a globalizing world.

Transnational traffic of goods and people brings both risks and opportunities for global health. Globalization of the food trade has increased the risks of food-borne diseases, but improving access to new technologies for developing countries can help reduce global inequalities in health.

Interdisciplinary collaboration between public health, sociology, geography, business, law, international affairs and public policy can define the risks and solutions to the challenges posed by globalization. Washington State earns more than $75 billion through global trade, and we are increasingly integrated with the world. The University of Washington with its deep capacity in the Global Business Center, Law and Health programs, the Jackson School and the Evans School is uniquely positioned to contribute new knowledge in this area.

#24: Training Biomedical and Health Informatics Workforce in Peru

Authors: *Patricia J. Garcia, Walter H. Curioso, Jose Segovia-Juarez, Jesus M. Castagnetto, Sherrilynne Fuller, Ann Marie Kimball*

(Universidad Peruana Cayetano Heredia, Lima, Peru; University of Washington, Seattle, WA, USA)

Abstract: In Peru, formal university graduate programs in biomedical and health informatics are beginning, and the Amauta Global Informatics Research and Training Program has helped to create the critical mass of professionals to launch such programs in the region.

The program is a collaborative partnership between Universidad Peruana Cayetano Heredia (UPCH) of Peru and University of Washington (UW) in the United States, supported by the Fogarty International

Center. The goals of the program are to train core professionals in health informatics and to strengthen the health information resource capabilities and accessibility at UPCH. The program strengthens informatics research capacity in Peru through short-term training at UPCH and long-term training for Peruvian professionals at the UW who return to Peru to enhance the informatics capabilities.

The Amauta program has offered three intensive short courses in Lima (2000, 2001 and 2005) in collaboration with UPCH. Biomedical and health informatics training is integrated with ongoing research programs so that both informatics capacity and biomedical research at UPCH are enhanced.

Projects supported by this program are leading to the development of sustainable training opportunities for informatics in Peru: 8 Peruvian fellows trained at the UW are now developing informatics programs and the information infrastructure in Peru.

UPCH is now offering the first Graduate Program in Biomedical Informatics in Peru, including a diploma and a master's degree. The program recognizes the need for inter-institutional collaboration with well-established health informatics training and research programs such as UW.

#25: Personal Digital Assistants (PDAs) to support HIV Treatment Adherence and Safer Sex Behavior Support in Peru

Authors: *Walter H. Curioso, Ann E. Kurth, Patricia Segura, Robinson Cabello, Donna L. Berry (Universidad Peruana Cayetano Heredia, Lima, Peru; University of Washington, Seattle, WA, USA; Asociacion Civil Impacta Salud y Educacion, Lima, Peru; Asociacion Via Libre, Lima, Peru)*

Abstract: We developed a Web-based application delivered on PDAs (Colecta-PALM) for persons living with HIV/AIDS (PLHA). Colecta-PALM provides tailored feedback (behavioral messaging) based on risk assessment responses for HIV patients. The application uses a wireless intranet secure connection to transfer Web survey pages from desktop server to wireless-enabled PDA.

Usability testing was undertaken with 15 PLHA in two HIV clinics in Lima, Peru using mixed methods including observation and semi-structured interview.

Users were 67% (10/15) mestizo with mean age 36.9 years (range: 26-55). All participants could use Colecta-PALM with minimal assistance. Time for session completion averaged 23.6 minutes; 67% (10/15) said length was acceptable. 60% (9/15) were somewhat/very satisfied with Colecta-PALM, with usefulness rated an average of 3.7 on ascending 5-point Likert-scale. 80% (12/15) indicated that the audio features provided tranquility, security and confidence. Users found the tool innovative, interesting, easy to use and understand, informative and educative, trustable, private, and non-judgmental. Users limitations noted were wireless connection problems, some sensitive questions and messages, tapping and scrolling were not initially easy for several people, and the PDA froze.

When participants were asked if they would choose a computer or a person (doctor/counselor) for HIV counseling, 67% (10/15) preferred a person, 26% (4/15) preferred both, and 7% (1/15) preferred a computer. Reasons for preferring a person included interaction and dialogue/clarification of concerns.

Colecta-PALM was well-received and easily usable by most. Computer counseling holds great potential for providing assessment and health promotion to PLHA, particularly as a supplement to scarce staff resources (http://www.colectapalm.org).

#26: Global Health Peru Portal: A Gateway for Peruvian Health Information

Authors: *Walter H. Curioso, Marcela Lazo-Escalante, Mabel Raza, Jesus M. Castagnetto, Alejandro Llanos-Cuentas, Patricia J. Garcia (Universidad Peruana Cayetano Heredia, Lima, Peru)*

Abstract: The Global Health Peru Portal (http://portal.globalhealthperu.org/) is a web-based system targeted for the general public and anyone who is interested in visiting, working or doing research in Peru. The web system, both in Spanish and English, has been developed by the Universidad Peruana Cayetano Heredia, and has been sponsored by the Department of Health of the Executive Yuan of Republic of China, and the US National Institutes of Health (through the Framework Programs for Global Health).

The portal is divided in two major topics: "health topics" and "geography".

The "health topics" section includes evidence-based information from selected infectious diseases and other health problems in Peru. This section does not present an extensive list of topics; instead, this section covers a general overview of major health topics with a global impact. One of the objectives of this section is to progressively include new topics as they arise.

The "geography" section includes epidemiological information about health topics divided by departments. In addition, each department contains general geographical and weather information. Finally, the portal includes a useful "recommendations for travelers" section. It is envisioned that the portal will include a virtual documentation center.

The portal complements the information provided in the Global Health Peru Program Website (http://www.globalhealthperu.org). The portal is a useful tool that compiles public health information in a user-friendly manner, and it is open for collaborations from national and international experts.

#27: Ethnomed: transformation of a clinical information resource

Authors: *E. Roberts, S. Tao, E. Howard*

Abstract: A great need for culturally appropriate health information exists, both to improve the health of individuals and communities, but also so that health care is provided more effectively and efficiently.

EthnoMed (http://ethnomed.org) was created in 1994 by clinicians and librarians to meet information needs of Harborview Medical Center care providers and their refugee /immigrant patients who come from ethnic communities relying heavily on Harborview for their care. The web site contains a wealth of original information kept in the public domain about cultural beliefs, medical issues and related matters, such as immigration and interpretation, pertinent to the health care of recent immigrants to the Seattle area. However, most of the information is applicable to other geographic areas. The documents featured on the site include materials that deal with a broad range of healthcare issues, such as TB, diabetes, blood draws, biopsy, and cancer screening.

Although we were state of the art both in terms of the use of technology and our content in 1994, by 2006 EthnoMed was not utilizing many advances in the field of informatics that relate to database management and Web design. Our content was still unique and valuable, but we lack technical enhancements that would allow us to provide more and better information with the available staff.

In 2006 we received a National Institutes of Health grant that is allowing us to transform our semi-static version of EthnoMed into a Web Site supported by Plone, an open source Content Management System. The poster describes reasons for and benefits of the transformation.

#28: EpiVAST Epidemiologic Visualization, Assessment and Surveillance Tool

Authors: *Richard E. Hoskins, Qian Yi, Elizabeth Hillringhouse, Svend Sorensen and James C. Wallace*

Abstract: We are developing an open source web-based application which can be used for exploratory spatial-temporal analyses at a variety of geographies and time periods. EpiVAST can be deployed in almost any computing environment for low or no cost because development is done only with open source software requiring modest hardware running Unix or Windows. The components include spatial analysis and visualization software developed from the R project (www.r-project.org) and the spatial scan statistic as implemented in SaTScan (www.satscan.org). The software would allow advanced analyses to be done for public health assessment, surveillance and program evaluation.

We are currently testing EpiVAST with cancer incidence and death certificate data provided by the Washington State Cancer Registry and the Washington State Center for Health Statistics. In the future, we will extend the application framework beyond US data to include international data.

#29: myPublicHealth.org :: Knowledge Management for Improved Public Health Decision-Making

Authors: *Sherrilynne Fuller, PhD – Principal Investigator & Co-Director, Center for Public Health Informatics, Debra Revere, MLIS, MA – Co-Investigator/Research Manager, Paul F. Bugni – Lead Software Engineer, John Kobayashi, MD – Epidemiology Consultant, Mark Oberle, MD, MPH – Director, Center for Public Health Informatics*

Abstract: PROBLEM: Managing the multiplicity of information types that drives public health and providing timely access at the point of need that is central to effective public health practice.

APPROACH: Knowledge Management tools are widely used by organizations that seek to bridge the "know-do" gap and deliver results more effectively. We are applying knowledge management principles—e.g., utilizing information needs to drive the system design—to build a customizable content management system tot support the collection, description, management, and retrieval of public health documents, data sets, guidelines, learning objects, and tools. The myPublicHealth system is designed to provide more effective ways to access public health knowledge and support innovative problem-solving and strategic thinking.

METHODS: Input from local public health professionals, through an information needs assessment and workflow analysis, have informed the system requirements, interface design, customizability features, and toolkits that provide subject-based content.. Rapid access to public health resources is achieved by integrative web services that support and enhance retrieval of critical information needed for decision-making by public health professionals. The myPublicHealth knowledge repository is being built through a collaborative process with public health practitioners and administrators, librarians, public health researchers, and software engineers at all phases of development.

RESULTS: myPublicHealth has been collaboratively designed as a "one-stop" public health content management system and is freely available at <http://myph.org>. The current web site is in beta form and is soliciting input from public health practitioners and potential users on a word-of-mouth basis. Plans are underway to incorporate this input into the next release, which will be followed by intensive marketing and formal requests for review and input from the practice community. Customizable versions of the system will be tested in one or more health department settings over the coming year.

#30: Enhancing global rural primary health care. Integral delivery and research model with information technology.

Authors: *Rodolfo J. Stusser[1], Thomas E. Norris[2], Richard A. Dickey[3], Robert L. Kriel[4], Linda E. Krach[4] ([1]Retired Researcher Freelance Consultant, Havana, Cuba; [2]University of Washington, [3]Wake Forest University, [4]University of Minnesota, USA.)*

Abstract: Background: Primary health care (PHC)-services have been used in Sub-Saharan Africa's small-isolated, rural-poorest-villages and other poor-regions. Research to improve rural-remote PHC-services access-quality-impact for the world's poor has lagged behind. Pernicious unhealthy-unmodern lifestyles-environments contribute to maintain ill-health and extreme-poverty.

Objective: To evaluate and enhance a global rural PHC-service delivery-research model for poorest-villages

Methods: A literature-review by PubMed, UN-Agencies, GO/NGOs' projects-reports and yearbooks-databases was made. Rural PHC-service delivery-research model funding, scope and means were compared to other global health care-research levels. A case-control retrospective-study with cohorts of thirteen-socioeconomic-indexes in 1900-1957-2005 by five-closed-transition, five-open-developing and ten-OECD nations was made. Secondary data-analyses utilizing the UN-Millennium-Village-Project Sachs-Ehrlich's clinical-economics approach were done.

Results: Global rural-remote health-problems require a balanced-integrated research-policy incorporating PHC-service research on development-economics and behavioral-change for healthy-modern lifestyles-environments, using the clinical-economics-method. The poorest-villages need a broader delivery-research model of "primary-health-and-life-care (PHLC)-services through self-sustainable integral-growth", which includes equitable-access to modern organization-technology and health-living standards. A paradigm shift from spending most global-funds on biomedical care-research, to investing more on PHLC-service delivery-research under a bioeconomic-psychosocial paradigm is necessary. This needs mobile-teams of physicians-nurses, economists-psychosociologists and agro-engineers, who care and research, physically and collaborating at-a-distance, through cutting-edge web-based care-research collaboratories, multiplying scientific-capacities. Global-public-private-partnerships of institutes-PHLC, North-South/South-South research net-clinics linking rural-professional-teams with most experienced-researchers, doing data-mining of poorest-villages' electronic-PHLC-records to understand and transform the care environments must be created.

Conclusions: Ideas to enhance rural-remote-health of the world's poor are argued: more investment in a global-PHLC-service research-delivery model, under a "bioeconomic-psychosocial paradigm", creating global-public-private-partnerships utilizing advanced-IT-based care-research net-clinics/networks/consortia.

#31: Vedado Project: electronic health in community primary health care. Design, rationale, initial and perspective results.

Authors: *Rodolfo J. Stusser,[1] Marco J. Albert,[1] Alfredo Rodríguez,[2] Suiberto Echevarría,[1] René I. González[3] y Alain Cuadot[1]([1] Researcher, Research Unit, Vedado University Polyclinic, Havana, Cuba; [2] National Center for Informatics Development in Public Health, Havana; [3] Central Institute for Digital Research, Havana.)*

Abstract: The design, rationale, initial and perspective results of the "Vedado"-electronic-health (e-health) projects in primary-health-care (PHC) and comprehensive-general-medicine (CGM) between 2002 and 2006 are briefly-exposed. The results attained initially with a managerial-information-system,
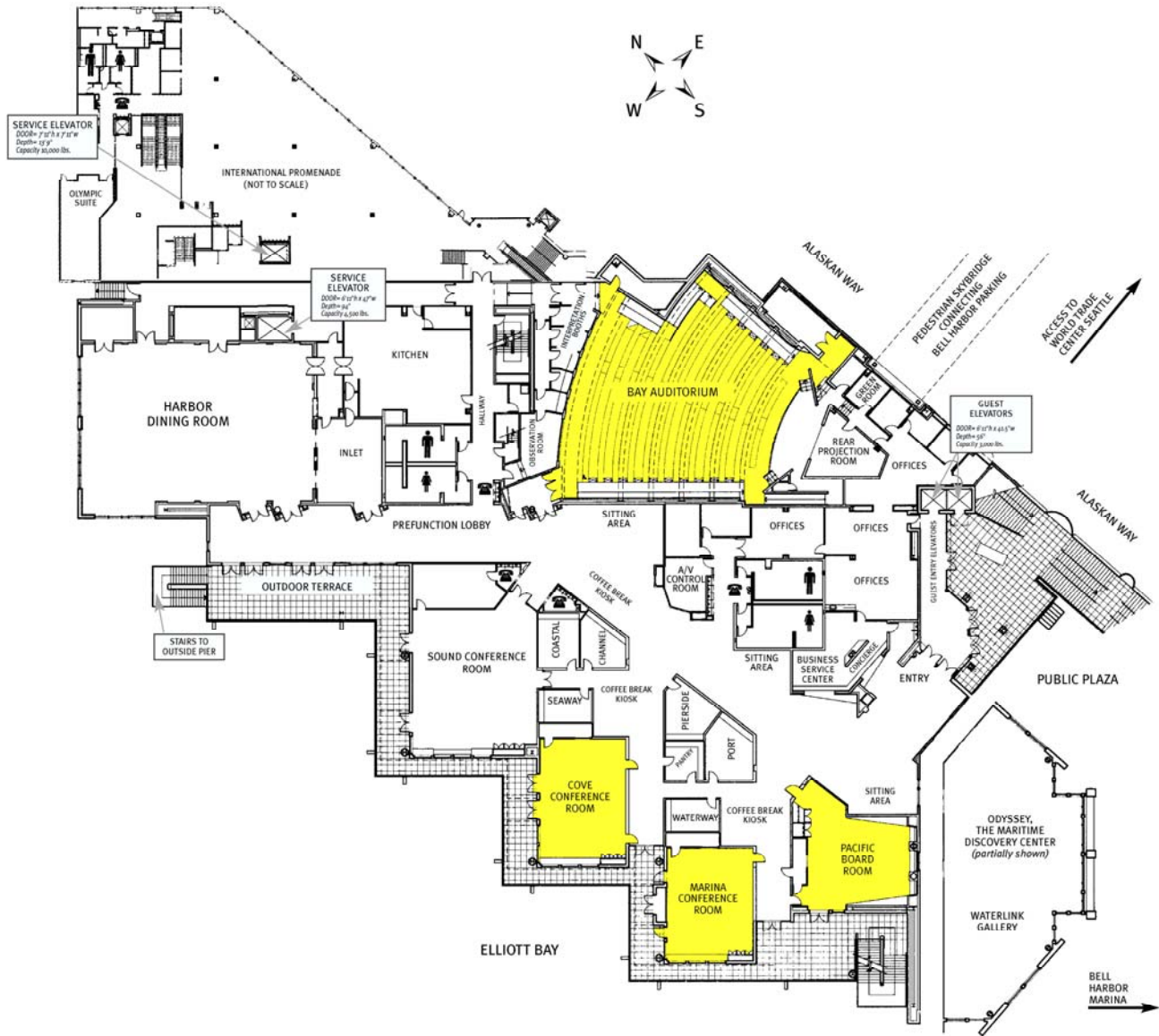
a tele-electrocardiographic-system of second-and-third-opinion, two-websites of the "Vedado"-University-Polyclinic, a multimedia-tutorial of anatomy in PHC, and a virtual-medical-university from this PHC-level are described. The perspective results of an on-line electronic-research-network at-a-distance and electronic-research-collaboration-center of the national-health-system starting from PHC, of the use of personal-digital-assistants and wireless-technology, as well as of a unique e-health-history from the family-physician's office to the rest of the national-health-system units are mentioned. The difficulties found were: lack of research-financing and administrative-priority; denied-authorizations for academic-exchanges and formalize collaboration-partnerships in USA, Japan and IT-advanced-countries; consideration of PHC-professionals as little-children, respecting hospitals and institutes; great-delay in e-health-records data-enter; lack of suitable-clinical-codes to handle the patients' e-health-records and to make longitudinal/transversal-section studies; lack of a mature-scientific-concept to create a comprehensive-health-classification with deaths-lesions-diseases-risks as-well-as health-specific-components, as physiological-preventative-dynamic as pathological-therapeutic-static, using rigorous research. It concludes that the results obtained so far have allowed a slow-small-improvement of the PHC/CGM efficiency. It is expected that the continuation of these projects and their extension will produce a leap of quality in the CGM services in the PHC-areas, mainly in the rural-small and isolate-poorest-areas of the country. It recommends to formalize an e-health-PHC-research-center/network, which orients-prioritizes the national PHC/CGM research problems, with research-projects' public-private partnerships and budgets, including tele-diagnostics and tele-surgery with minimum-access, above all in the rural-areas, and to facilitate the e-health-research-collaboration, trainings and academic-exchanges overseas.

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