



Avian flu has been making headlines for several months. Our feature article offers a realistic perspective on the potential global effects of the H5N1 virus.

A Quarterly Newsletter

Vol. 1, No. 1 — Winter 2006

Feature Article:

Gary Smith, DPhil, MA, MA, provides insight on avian flu



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Avian Flu Update

Gary Smith, DPhil, MA, MA (Professor of Population Biology and Epidemiology, School of Veterinary Medicine)

Since Christmas Day, 2003, 138 laboratory-confirmed cases of Avian Influenza (H5N1) infection in people have been reported to the World Health Organization (WHO). As of 12/14/05, 71 of those cases (42 in Vietnam, 14 in Thailand, 9 in Indonesia, 4 in Cambodia, and 2 in China) have died. Many patients developed a pneumonia impervious to antibiotics. Disease due to infection with H5N1 influenza is a zoonosis. This should not surprise us: 60-75% of human infectious disease is zoonotic. This particular flu virus is currently

the cause of an unprecedented pandemic of Highly Pathogenic Avian Influenza (HPAI) in domestic poultry originating in Asia but which, in the last two or three months, has also been detected in domestic poultry flocks in Russia, Turkey, Romania, and Croatia as well as at least one quarantined imported parrot in the United Kingdom and two Mountain Hawk Eagles smuggled into Belgium.

Most, but not all, of the reported human cases had documented exposure to dead or dying domestic poultry. Currently, those at greatest risk appear to be rural subsistence farmers and their families who have slaughtered and prepared domestic birds for cooking. No cases of H5N1 infection have occurred in poultry workers, cullers, veterinarians or laboratory workers. Nor have cases been detected in health care workers, despite several instances of close unprotected contact with severely ill patients. The H5N1 virus has also caused two catastrophic epidemics of

influenza among tiger populations in zoos in Thailand. The tigers had been fed raw poultry and are thought to have inhaled the virus during mastication. The outbreaks in tigers are significant for two reasons. First, no one would have predicted that the virus could cross this particular species barrier (and we now know that domestic cats can be infected, too). Second, there is evidence of tiger-to-tiger transmission of the virus long after they had been fed raw poultry. Until these outbreaks, there had been little evidence for mammal-to-mammal transmission of the H5N1 virus (the evidence for human-to-human transmission of the H5N1 virus is meager) and some had taken solace in that fact.

Good flu statistics are hard to come by. We have no idea how many

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From the Director:

Welcome to the first edition of our newly redesigned newsletter, intended to keep you informed of activities within the Center for Clinical Epidemiology and Biostatistics (CCEB). We will focus on the research activities of our faculty, research and training services available to those external to the CCEB, and various items of interest.

As with this issue, future newsletters will be announced via e-mail, which will allow for selection of individual articles. The newsletters also will be posted and archived on our website, for those who wish to read the entire newsletter.

This edition of our newsletter nearly coincides with the launching of our new website, scheduled for mid January. Our newly designed web pages will be easier to navigate and will contain new features of interest to visitors, particularly a news and announcements section displayed prominently on our home page, upcoming seminars and other events of interest. The URL for our site will remain: <http://www.cceb.upenn.edu/main>.

In this issue, Gary Smith, DPhil, MA, MA, Professor of Population Biology and Epidemiology with the School of Veterinary Medicine, and Associate Scholar with the CCEB, has written a very timely feature article about the spread of avian flu. We also have included articles introducing two of our new faculty members: Hongzhe Lee (Li), PhD, and Kathryn Schmitz, PhD, MPH.

I hope you enjoy this issue of our newsletter. Be sure to visit our new website on a regular basis to see what we are doing.



Brian L. Strom, MD, MPH

Faculty Profile:

Hongzhe Lee, PhD, heads the Statistical Genetics and Genomics Laboratory



Hongzhe Lee, PhD, poses in front of family photos.

An eager student intrigued early by architecture, Hongzhe Lee (Li) shifted toward study in mathematics with the guidance and encouragement of his father, a high school math teacher. Hongzhe obtained a BS degree in Mathematics/Information Sciences from Peking University in 1989. His concentration in applied rather than pure mathematics made the study of statistics an appropriate pursuit. He received his PhD in Statistics at the University of Washington, Seattle in 1995, where, under the tutelage of Dr. Elizabeth Thompson, an early pioneer in statistical genetics,

he developed an interest in biostatistics in general and statistical applications in genetics and genomics in particular. His doctoral research focused on developing novel statistical methods for estimating the genetic and environmental effects on complex traits in family studies.

Upon completing his PhD, Dr. Lee worked for three years as Research Associate Biostatistician at the Mayo Clinic. In the ensuing seven years, he rose through the ranks of Assistant and Associate Professor of Biostatistics and Human Genetics at the University of California Davis School of Medicine Rowe Program in Human Genetics. A year before his arrival here, Dr. Lee served as Visiting Associate Professor in the Department of Statistics at Stanford University from April to August 2004 and left his tenured Associate Professor position at UC Davis to join the Penn CCEB. In fact, he was recruited to join the Division of Biostatistics, Department of Biostatistics and Epidemiology, on May 1, 2005 as Professor of Biostatistics with tenure and Senior Scholar in the Biostatistics Unit of the CCEB. His particular charge is to lead the Statistical Genetics and Genomics Research Program within the Center for Genetics and Complex Traits, headed by Tim Rebbeck.

Dr. Lee's statistical research interests include developing statistical, probabilistic, and computational methods for analysis of genetic and genomic data; survival analysis; bioinformatics; analysis of high-dimensional data; computational biology; and functional genomics. In 1998, he won the International Genetic Epidemiology Society's Best Paper Award. Since then, his research has been supported by an NIH R01 grant on developing improved linkage/linkage disequilibrium and survival analysis methods for mapping genes for complex human diseases. The project is currently in the third round of funding. Dr. Lee is also involved in funded collaborative research on genetic and genomic studies of autoimmune diseases and cancers using novel admixture mapping approaches. Recently, he has been developing statistical methods for analysis of microarray time course gene expression data, methods for linking high-throughput genomic data such as microarray gene expression data and array CGH data to censored survival data and methods for inferences

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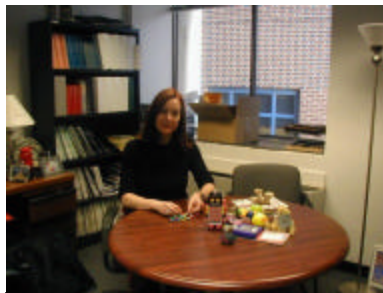
Faculty Profile:

Kathryn Schmitz, PhD, focuses on the effects of physical activity on obesity and cancer

In this season of gift-giving, there might not be a more apropos faculty member to introduce than Dr. Kathryn (Katie) Schmitz, whose office on the 9th floor of Blockley Hall is festooned with an intriguing array of toys designed to relieve stress, spark the imagination, and test coordination. (Lest anyone get off on the wrong track here, Dr. Schmitz is quick to point out that Twister is not available; these are all table-top toys.) The way that colleagues and other guests first approach the gaggle of interactive gadgets, games, and gewgaws gives Dr. Schmitz a glimpse into her guest's psychological make-up. Likewise, the very presence of this fun office entrance exam reveals to us just a little about her active mind and kinetic thoughts in the important role of physical activity in health outcomes, particularly related to obesity and cancer.

After earning a BA in Economics at the University of North Carolina, Greensboro in 1984, Katie promptly headed to New York City to do what few economists ($p < 0.001$) do, join the Martha Graham School of Dance, where she joyfully toiled for four years. This illuminating and grueling experience, during which she learned the value of working as a team player and occasionally facing rejection, inspired interests in yoga and Pilates and, eventually, manifested in work as a fitness trainer. Not sufficiently enlightened by this work, she began taking

classes towards a master's degree and, in the process, participated in an intervention study to augment physical activity in students. In 1994, Katie earned an MEd in Exercise Physiology from Queens College, City University of New York.



Kathryn Schmitz, PhD, pauses in front of her assorted array of challenging and relaxing games and toys.

her burgeoning intellectual interests at the University of Minnesota where, in 1998, she completed a PhD in Kinesiology (Major) and Epidemiology (Minor) and, in 1999, an MPH in Epidemiology. Dr. Schmitz proceeded then to pursue an interdisciplinary approach to her field at the University of Minnesota, merging exercise physiology with preventive epidemiology.

Pirouetting to the present, Dr. Schmitz left her position as a tenured Assistant Professor of Epidemiology at the University of Minnesota to join the Department of Biostatistics and Epidemiology and the CCEB on July 1, 2005 as Assistant Professor of Epidemiology and Senior Scholar. In addition to continuing her independent research here, she looks forward to tapping into "the enormous wealth of shared knowledge" here to collaborate with researchers across disciplines, and providing classroom instruction and career counseling to students in the department's masters' and doctoral pro-

grams.

Dr. Schmitz has come to focus specifically on the mechanisms underlying the association of physical activity with obesity, metabolism, and carcinogenesis across the cancer control continuum from causation and prevention through survival. In terms of impact on patients, her primary emphasis regarding obesity and its sequelae is on *prevention, treatment, and rehabilitation* across the life span. Dr. Schmitz has conducted randomized controlled trials to evaluate the effects of physical activity interventions in various populations across the cancer control continuum and has particular expertise in designing and conducting physical activity interventions in various populations, as well as measuring physical activity and fitness.

Since 2000, Dr. Schmitz's work has been supported by several grants, including seven grants as Principal Investigator, two of which are NIH R01s. The first is a randomized controlled trial to assess the efficacy of twice-weekly strength training to prevent age-associated body fat increases (The Strength Training for Obesity Prevention or STOP Trial), which completed enrollment and the intervention phase in June 2005. Her second R01, the Physical Activity and Lymphedema (PAL) trial, began upon her arrival at Penn and is the first full-scale randomized controlled trial to evaluate the safety of strength training among breast cancer survivors with and without lymphedema.

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CCEB's Clinical Research Services

The CCEB serves as an interdisciplinary resource for clinical research throughout the School of Medicine and offers a range of services, primarily to faculty, residents, and fellows within the University of Pennsylvania Health System, but also to clinicians and scientists throughout the Delaware Valley with interests in such services. These services will be identified and described as a regular feature of this newsletter.

The CCEB has developed a series of clinical research training courses, beyond those offered through its formal degree granting programs, in recognition of the numerous faculty, residents, fellows, and others who have full-time commitments during the day. Some of these courses are similar in content to courses offered through the degree programs, but several vary, deferring to the different needs of the non-matriculating students. These courses are offered in the late afternoon or early evening during the fall and spring semesters and/or as intensive, short courses during the summer.

A complete listing of these training courses is provided on the program website (<http://www.cceb.upenn.edu/main/education/specialEducationCurriculum.html>). Note that two courses, an introductory course in biostatistics and a course on the critical appraisal of medical literature, are offered in the spring semester, which begins in early January. Those interested in registering for any of these courses should contact Cathy Mulvaney (cmulvane@cceb.med.upenn.edu).

Individuals interested in clinical research training courses who

envision careers as collaborative researchers should consider enrolling in the CCEB's Clinical Research Certificate Program. The amount of coursework required for the Certificate is much less than that required for a degree-granting program. Further, the Certificate Program does not include completion of a research project. This program requires individuals to complete a series of core and elective courses, including courses covering each of the following topics: research methods, biostatistics, practical applications of research, and scientific and ethical research conduct. A

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2005 Clinical Research Certificate Recipients

Congratulations and best wishes to those who have been awarded Clinical Research Certificates!

May 2005

Reza Daugherty, MD
Lauren Elman, MD
Francis Hoe, MD
Karen O'Connell, MD
Michael Posencheg, MD
Allison Zwingenberger, DVM

December 2005

Suzanne Beno, MD
Tami Benton, MD
Jane Buckle, PhD
Kara Coassolo, MD
Andres Pinto, DMD
Miao Wang, PhD
Yanping Wang, PhD

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Thomas O. Kelly, PhD

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people have already been infected with H5N1. It may be a large number. We could try arguing by analogy. An outbreak of HPAI (H7N7) in the Netherlands afflicted 250 domestic poultry flocks in 2003. Approximately 4,500 people were directly involved with controlling the epidemic. Of the 453 people that became ill during and shortly after their involvement, 77% had evidence of conjunctivitis, 20% had an influenza-like illness, and one veterinarian died. H7 virus was isolated from 20% of the people who became ill (including the veterinarian). The HPAI (H7N7) outbreak in the Netherlands was geographically confined and involved a small number of flocks. The HPAI outbreak in Asia (and now Europe) spans a dozen countries and involves an unknown (but very large) number of flocks. If the H5N1 virus behaves like the H7N7 virus, we might speculate that a large number of people have become infected with H5N1 and that the current case fatality rate (>50%) is grossly inflated because our denominator (the number of infections) is much too small. Some have taken solace in this, too. The problem is, we just don't know.

The fear, of course, is that the H5N1 virus will acquire the ability to transmit person to person. We have known for many years that human flu epidemics were caused by viruses that were ultimately avian viruses in origin. However, until recently, it was believed that the genetic re-assortment necessary to enable these avian viruses to circulate in human populations could occur only in animals, like pigs, which could be co-infected with avian influenza viruses and influenza viruses already circulating in people. This is wrong. It is probably the explanation for the origin of the viruses that caused the human influenza pandemics in 1957-1958 and 1968-1969, but does not account for the virus that caused the catastrophic

pandemic of 1918-1919. In the last month, articles in *Science* and *Nature* showed that the 1918 virus was derived wholly from an ancestor that infected birds. The emergence of the H5N1 virus in poultry in 1997, and the demonstration that it could infect people directly, was the first indication we had that such a mechanism was possible. It seems probable that the genetic event or re-assortment we should worry about will happen in someone co-infected with H5N1 and an already circulating human-adapted flu virus.

The transmission dynamics of this putative virus are unknown, but if we again take the dangerous step of arguing by analogy we can draw some (possibly) reasonable conclusions. Mathematical modeling studies of previous flu pandemics in people (including the 1918-1919 pandemic) suggest that the basic reproduction ratio (R_0) for flu infections is 4 or less.

"Should person-to-person transmission begin, we can expect the number of incident infections and resulting deaths to double every three days."

This rather arcane statistic can be understood as the number of secondary cases arising from the first case introduced into a wholly susceptible population. The utility of R_0 is that it provides an index of the potential severity of an outbreak and the effort needed to bring an epidemic under control. For example, one commentator remarked that the good news about SARS (Severe Acute Respiratory Syndrome) was that its R_0 was as small as 4. The same commentator remarked that the bad news about SARS was that its R_0 was as large as 4. In other words, this meant that the SARS attack rate was likely to approach 100%, yet, even so, non-medical interventions (like quarantine) could be expected to bring an epidemic under control, which is what happened. Unfortunately, we should not be too reassured by this. Prior to 1997, no one alive today had

been infected by flu viruses of the H5 subtype. The current world population is completely susceptible and an R_0 of around 4 guarantees a very high attack rate indeed. But surely, by analogy with SARS, with an R_0 this small, we should be able to contain the H5N1 virus? Probably not... Avian Flu is not SARS. Flu viruses are much more contagious than the SARS coronavirus, have a shorter incubation period, and the virus can be spread *before the onset of symptoms*. Quarantine is bound to be much less effective. Recent work suggests that an H5N1 virus that acquires the ability to transmit person to person could be contained, but only if its R_0 were less than 1.8.

So where does that leave us? The WHO convened a meeting in early November to confirm its Avian Influenza control strategy. The strategy aims to control AI "at source in animals for the short and medium term and to simultaneously prepare for pandemic influenza." In short, we rely upon veterinary and agricultural authorities to suppress the epidemic in domestic birds. This is essential to ameliorate the catastrophic economic impact of this infection in poultry; but it also serves as a delaying tactic. The fewer opportunities this virus has to co-infect someone with an already circulating human-adapted influenza virus, the longer (we hope) it will take for a human pandemic to begin. In the meantime, safety trials on a vaccine have begun recently. Already, problems have arisen. For example, the amount of antigen required to elicit a response thought to be protective is many times larger than that needed for the influenza viruses of recent experience. This decreases our ability to respond quickly in the face of an outbreak and much current effort is going into investigating methods of rendering smaller doses effective. Should person-to-person transmission begin, we can expect the number of incident infections and resulting deaths to double every three days.

Included among her important contributions to her field of inquiry is the exploration of strength training as a behaviorally feasible and efficacious intervention to prevent age-associated body fat increases through the Weight Gain Prevention Study (published in 2003 in the *International Journal of Obesity and Related Metabolic Disorders*). In addition, Dr. Schmitz has made significant contributions to improving measurement of physical activity, particularly among youth, with six publications on this topic. Because the benefits of physical activity require behavioral modifications for most people, Dr. Schmitz places particular emphasis on physical activity interventions and research to better understand physical activity behavior. Her well-funded research has been presented and published in leading journals in several fields, including the *American Journal of Epidemiology*, *American Journal of Medicine*, *American Journal of Preventive Medicine*, *American Journal of Public Health*, *Annals of Epidemiology*, *Cancer Epidemiology Biomarkers and Prevention*, *Obesity Research*, *International Journal of Obesity and Related Metabolic Disorders*, *the Journal of School Health*, *Medicine and Science in Sports and Exercise*, and *Preventive Medicine*.

Dr. Schmitz's research has also been recognized nationally in award competitions and invitations for national speaking engagements. In 2000, she garnered the Jeremiah Stamler Research Award for New Investigators from the American Heart Association Council on Epidemiology and Prevention and the Student and Junior Investigators Award in the Mechanisms Category at the Physical Activity and Cancer Conference at the Cooper Clinic in Dallas, TX. In addition, Dr. Schmitz has been recognized nationally as an invited speaker for a Federation of American Societies for Experimental Biology (FASEB) summer conference on obesity as well as other national speaking engagements. In 2003, she was elected as a Fellow of the American College of Sports Medicine. She has also been invited to serve on two national special emphasis panels for the NIH and is a reviewer of grants for the Robert Wood Johnson and the General Mills Foundations. And just this December, Dr. Schmitz was selected as one of the recipients of the Trudy Bush Fellowship for Cardiovascular Research in Women's Health, which will be presented during the 46th Annual Conference on Cardiovascular Disease Epidemiology and Prevention, slated for March 2-5, 2006 in Phoenix, AZ.

Now, she is eager to invite fellow Penn researchers to her engaging environs to discuss future collaborations.

Mark your calendars!

The official launching of the re-designed CCEB website is scheduled for the middle of January 2006.

In the News

On Thursday evening, October 20, 2005, **Sandra Norman, PhD, FACE**, Research Associate Professor of Epidemiology in the Department of Biostatistics and Epidemiology, and a Senior Scholar in the CCEB, received the National American Cancer Society's St. George Award and the Pennsylvania ACS's Sword of Hope Award. These are the highest service awards bestowed upon a member for distinguished, exemplary, and inspirational leadership. Dr. Norman is the first individual to garner both awards together at the annual ceremony.

At the American Heart Association (AHA) convention in Dallas, TX on November 13, 2005, **Shiriki Kumanyika, PhD, MPH**, Professor of Epidemiology in the Department of Biostatistics and Epidemiology, Senior Scholar in the CCEB, Associate Dean for Health Promotion and Disease Prevention, and Director, Graduate Program in Public Health Studies (MPH Program), was awarded the first-ever AHA Population Research Prize, which recognizes an individual making outstanding contributions to the advancement of cardiovascular science and who currently heads an outstanding cardiovascular population research laboratory. A day earlier in Dallas, Dr. Kumanyika received the 2005 Dr. Herbert W. Nickens Epidemiology Award from the Association of Black Cardiologists, Inc (ABC). The award honors outstanding achievement in epidemiologic research in cardiovascular disease.

On December 7, 2005, **William Holmes, MD, MSCE**, Assistant Professor of Medicine and Epidemiology, Department of Medicine, Division of General Internal Medicine, and Senior Fellow in the CCEB, was interviewed by Marty Moss-Coane on WHY?y's Radio Times (<http://www.whyy.org/91FM/radiotimes.html>) regarding his research into the sexual/physical abuse of boys.

Brian Strom, MD, MPH, Director of the CCEB, Associate Vice Dean, Penn SOM, was recently interviewed for the article "Researchers press for risk-stratified analysis of clinical data," which appeared in the December 12th edition of *American Medical News* (<http://www.ama-assn.org/amednews/2005/12/12/hlsa1212.htm>).

John Farrar, MD, MSCE, Ph.D, Assistant Professor of Epidemiology, Department of Biostatistics and Epidemiology, Assistant Professor of Anesthesia, Department of Anesthesia, and Senior Scholar in the CCEB, was recently quoted in *The Wall Street Journal*. Dr. Farrar gets the final word in the article "Ghost Story: At Medical Journals, Writers Paid by Industry Play Big Role" (<http://online.wsj.com/public/us>).

(Lee, continued from page 2)

of genetic networks. In addition, he is an investigator of the Genetics of Aging and Longevity Consortium, directed by Dr. Steve Cummings at the University of California San Francisco, and an investigator of the Human Pharmacogenomics Epidemiology project directed by Dr. Steve Kimmel at the CCEB. Since joining Penn, Dr. Lee has been funded by a Pennsylvania Department of Health grant to develop novel statistical methods for integrative analysis of cancer genomics data, including methods to incorporate biological pathways information into analysis of high-dimensional genomic data and methods for studying genetic pathways and networks using sparse Gaussian graphical models.

The Statistical Genetics and Genomics Research Program conducts both methodological and collaborative research in statistical genetics/genomics, genetic epidemiology, functional genomics and computational biology. In addition to Dr. Lee, faculty members in this new research program include Mahlet Tadesse, ScD (with primary research interests in Bayesian modeling, functional genomics, gene expression profiling, microarray methods, cancer epidemiology, and cardiovascular epidemiology); Nandita Mitra, PhD (with a primary focus in statistical genetics, cancer genetics, and outcomes research); Kim Sellers, PhD (with a research focus on functional modeling, microarray methods, image analysis, proteomic analysis, gene expression profiling, and cancer epidemiology); and Mary Putt, PhD, ScD (with a research focus on analysis of microarray gene expression data). The lab is actively recruiting and will be joined in January by Drs. Jinbo Chen and Mingyao Li. Dr. Chen's research has primarily focused on statistical inference for regression models when the outcome and/or covariates are missing for some subjects and statistical methods for genetic and molecular epidemiology. Dr. Li's main research interest is statistical genetics and genomics, with the goal of developing statistical and computational methods for genetic and genomic data analysis and identifying and characterizing genetic variation influencing susceptibility to complex diseases. Dr. Li won the 2005 Cotterman Award for best student paper published in the *American Journal of Human Genetics*. Faculty members in the laboratory are assisted by their students and post-doctoral fellows.

Dr. Lee's goal is to develop and implement new statistical methodology for genetic and genomic studies of complex diseases, applying these methods to actual data sets of various complex diseases. He and other faculty members in the Statistical Genetics and Genomics Laboratory are particularly interested in developing novel statistical and computational methods through close collaborations with other epidemiologists and basic scientists in order to gain insights into studies of complex diseases and complex biological systems.

Dr. Lee has been the primary author for papers appearing in the *American Journal of Human Genetics*, *Annals of Human Genetics*, *Bioinformatics*, *Biometrics*, *Biostatistics*, *Frontiers in Bioscience*, *Genes and Immunity*, *Genetic Epidemiology*, *Genome Biology*, *Genome Research*, *Human Genetics*, *Human Heredity*, *Journal of the American Statistical Association*, *Lifetime Data Analysis*, *Pacific Symposium on Biocomputing*, and *Statistical Applications in Genetics and Molecular Biology*. He also serves as an Associate Editor of the *Journal of the American Statistical Association*. As always, Dr. Lee maintains an avid interest in collaboration with a keen eye towards projects that allow application of novel biostatistical methods to medical problems while also offering new insights into studying complex diseases and biological systems.

(Clinical research services, continued from page 4)

minimum of four courses is required. Individuals also are required to complete a series of web-based programs covering bioethics, patient-oriented research, and federal regulations regarding privacy rights of patients and the handling of protected health information (HIPAA). This program can be completed in one to two years, assuming courses are taken at the rate of one per term/semester. The first Clinical Research certificates were awarded in May 2005. Additional certificates were awarded in December 2005. A complete list of certificate recipients is included here on page 4. Additional information about the Certificate Program requirements can be found on the program website (<http://www.cceb.upenn.edu/main/services/certificateProgram.html>).

To support training through the Clinical Research Certificate Program, the CCEB is pleased to announce the availability of the Mary E. Groff Fellowship in Clinical Research Methods. Through the generosity of the Mary E. Groff Charitable Trust, fellowships are available to UPHS-affiliated residents and fellows. Applicants must be interested in academic careers as clinician educators performing collaborative research. This fellowship is not designed for those enrolled in formal clinical research degree-granting programs or those interested in careers as independent investigators, such as the Master of Science in Clinical Epidemiology and Master of Science in Translational Research degree programs. Individuals interested in information about the application process should consult the Mary E. Groff Fellowship website (<http://www.cceb.upenn.edu/main/services/groffFellow.html>).

If you are interested in additional information about the CCEB's clinical research training opportunities, please contact Tom Kelly (tkelly@cceb.med.upenn.edu).

Congratulations and best wishes to the following students for completing their degrees!

Master of Science in Clinical Epidemiology Degree Recipients

May 2005

- Michael Berkwits, MD
- Karine Chung, MD
- Catherine J. Datto, MD
- Esi Marie Morgan DeWitt, MD
- Aaron J. Donoghue, MD
- Mary Lou Galantino, PT, MS, PhD
- Steven Wai Ing, MD
- Nayyar Iqbal, MD
- Vincent Lo Re III, MD
- Bradley Scott Marino, MD, MPP
- E. Andrew Ochroch, MD
- Leslie Jane Raffini, MD
- Theoklis E. Zaoutis, MD

December 2005

- Laura Louise Kruper, MD
- Catherine Lynn Kuntz, MD
- Donald Scot Malay, DPM
- Ilene M. Rosen, MD
- Amy Hirschfeld Schultz, MD

Doctorate in Epidemiology Degree Recipient

May 2005

- A. Russell Localio, JD, MPH, MS, MA

Master of Science in Biostatistics Degree Recipients

May 2005

- Mengye Guo
- John Palcza
- Wenguang Sun
- Ye Zhong, MS

Doctorate in Biostatistics Degree Recipient

August 2005

- Clara Kim, MA

CCEB Photo Gallery: Graduation



Pictured (back row, left to right) are MSCE graduates A. Ochroch, J. Sager (graduated in Dec. 2004), B. Marino, J. Farrar (who completed his PhD in Dec. 2004), N. Iqbal, Dr. Strom, E. Morgan DeWitt, C. Datto, M. Galantino, and S. Layton, Associate Director, Graduate Training in Epidemiology. Not pictured: M. Berkwits, K. Chung, A. Donoghue, S. Ing, V. Lo Re, L. Raffini, and T. Zaoutis.



Pictured left to right are MS Biostatistics graduates Y. Zhong, M. Guo, and J. Palcza. Missing from picture: W. Sun.

CCEB 2005 AIDS Walk Team



Above, the 2005 AIDS Walk Team prior to the 8.5-mile trek and, below, at the half-way point, with the remainder of the team, pausing at the Falls Bridge.



Left, A. Russell Localio, JD, MPH, MH, MA, (PhD graduate); right, Brian L. Strom, MD, MPH.

2005 CCEB Holiday Party



Holiday cheer shared by CCEBers of all ages.



Notice: Two New Courses for Spring 2006
BSTA 785: Statistical Methods for Genomic Data Analysis
BSTA 786/EPID 730: Advanced Topics in Clinical Trials