

Global Health Matters

Fogarty International Center (NIH/HHS)
"Science for Global Health"

NIH Director Addresses FIC Advisory Board

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NIH Director Elias A. Zerhouni, M.D., recently shared with the FIC Advisory Board both the state of the NIH and his vision of its future.

He noted that the NIH, like the boat in the popular film, is passing through a perfect storm, testing all the skills of the captains of the Institutes and Centers. The unexpected conditions affecting NIH include the federal and trade deficits, the defense and homeland security needs, Hurricane Katrina and the pandemic flu funding.

In the midst of this storm, Dr. Zerhouni asked where do we go from here and what do we do?

"When you hit stormy weather, you batten the sails, you think about where you are going, you get good intelligence, good facts, and go from there. So, first, know the facts; second,

adopt the strategies," advised the NIH Director. He recommended that the Fogarty Advisory Board think through its priorities



Drs. Elias A. Zerhouni and Roger I. Glass

and fundamental core mission and protect the essentials, which, for Dr. Zerhouni, are advancing knowledge and discovery.

He also asked the Advisory Board to focus on new investigators.

Recalling his early days as a researcher, he stated, "I remember in the 1980s, I was a new investigator. I saw many good friends, bright scientists, who just

left, because they were told all these dire stories. Lo and behold, I stayed in and got funded, and this is where I am! If I had not done that, if

I had been discouraged from doing it, or I had no receptivity at NIH, I think I wouldn't be here today. And I think thousands of other people are at risk for doing this."

He closed his talk with these words: "We are in the business of

transforming medicine through discovery. Every institution goes through rough patches. The key is, do you know what is happening to you, do you know where the wind is coming from, do you know where the safe harbor is, and follow that track.

"Don't go away from your core mission; that is the key. The core mission is new scientists, great ideas, great science and great service to the people."



FIC STAFF RECEIVE NIH DIRECTOR'S AWARD

Three members of the FIC staff received awards this year at the Annual NIH Director's Award ceremony July 12, 2006.

The NIH Director's Award "recognizes superior performance or special efforts significantly beyond the regular duty requirements, and directly related to fulfilling the mission of the National Institutes of Health."

Dr. Aron Primack, Division of International Training and Research, received a Commissioned Officer Meritorious Service Medal for his exemplary scientific leadership and essential mentoring role in implementing the initial awards under the FIC Global Health Initiative Program (GRIP) for new foreign



Drs. Sharon Hyrnkow, Aron Primack, Elias Zerhouni and Richard Wyatt

investigators and the Fogarty-Ellison Fellowship in Global Health and Clinical Research.

Dr. Joel Breman, Division of International Epidemiology and Population Studies, received the award for his superb work as managing editor of the Disease Control Priorities Project (DCPP). The culmination of the 4-year DCPP project was the publication of seminal documents that will



Drs. Sharon Hyrnkow, Joel Breman and Elias Zerhouni

inform policymakers in poor countries for years to come on the most cost-effective means to improve health and well-being in resource-poor settings. Joel was instrumental in gaining input and support for the DCPP from across the NIH, and in ensuring that all Institutes and Centers, as well as the NIH Director, have DCPP information at the

ready for communications with counterparts from around the world.



Drs. Sharon Hyrnkow, Linda Kupfer and Elias Zerhouni

Dr. Linda Kupfer, Division of Advanced Studies and Policy Analysis, received the award for her outstanding efforts and leadership in developing and implementing a systematic and comprehensive strategy to evaluate FIC programs. In addition, while on detail to the NIH Office of the Director, she played the key role in identifying ways and organizational means to strengthen the whole of the NIH evaluation program. Such efforts are essential in ensuring that programs meet their expected aims and that they are having as great an impact as possible.

UPCOMING PROGRAM ANNOUNCEMENTS AND REQUESTS FOR APPLICATIONS

Program	Contact	Receipt Date	Eligibility
Trauma & Injury	Aron Primack, MD primacka@mail.nih.gov	August 25	U.S. institutions; Private Investigators must be project director or key personnel on NIH, CDC or Dept. of Transportation Trauma Centers "parent" research or training grant with at least 18 months of active research support remaining at time of application; only one application per U.S. institution will be accepted http://www.fic.nih.gov/programs/Trauma.htm
Global Infectious Disease Research and Training Program	Barbara Sina, PhD barbara_sina@nih.gov	September 13	US and institutions from low- to middle- income countries with demonstrated history of research collaboration http://www.fic.nih.gov/programs/training_grants/gid.htm
Fogarty International Research Collaboration Award - Basic Biomedical and Behavioral and Social Sciences	Kathleen Michels, PhD mickelsk@mail.nih.gov	September 21	Private Investigator of U.S. based NIH-sponsored research project grant that will be active for at least 1 year beyond submission date of application, in collaboration with partner institutions in low- to middle-income countries http://www.fic.nih.gov/programs/firca.html
GRIP Basic Biomedical and Behavioral and Social Sciences	Aron Primack, MD primacka@mail.nih.gov	September 21	Low- to middle- income scientists currently or recently supported through FIC D43 international training programs, through NIH Visiting Program for Foreign Scientists, or as NIDA INVEST or Humphrey Fellowships. http://www.fic.nih.gov/programs/research_grants/grip/index.htm

SUB-SAHARAN AFRICAN JOURNALS IN MEDLINE

While they are a critical source of medical information for local health practitioners and research scientists, most sub-Saharan journals are not indexed in NLM's MEDLINE. In fact, most information published in Africa never leaves its home borders because the journals are largely not included in major bibliographic databases. Such databases have criteria—ranging from quality of content to production quality—that must be met before a journal is accepted for indexing. Only 20 of the 4,900 journals indexed by MEDLINE are from sub-Saharan Africa.

To address this overwhelming disparity, FIC has partnered with NLM and NIEHS over the past two years to fund a pilot program that strategically targets journals in sub-Saharan African countries where NIH has research investments—in Ghana, Mali, Malawi, and Uganda. In this

unique project, each editor has been paired with a group from high-profile international journals including the *Lancet*, *BMJ*, *JAMA*, *The American Journal of Public Health*, and *Environmental Health Perspectives*.

Karen Hofman, M.D., director of DASPA, represented FIC at the Annual Meeting of the African Medical Journal Editors Partnership Program (AMJEPP) in May. Training workshops were held to assist the African Journal staff with their manuscript writing skills, to increase publishing regularity, and to improve the peer-review process. This training will enable the sub-Saharan African journals to be indexed under MEDLINE.

Mali Médical, the only francophone journal of the three, has made some exciting developments in the past year.

The journal is publishing on a regular basis for the first time, is in the process of building a sustainable business model, and has applied for inclusion in MEDLINE. In addition, in the area of PubMed Central submissions, *African Health Sciences* and *Ghana Medical Journal* have submitted four issues each to PubMed Central, which will enhance their visibility and will provide a long-needed connection to current information exchange systems.

Malawi Medical Journal also announced a variety of promising plans to increase sustainability--they plan to be online and fully accessible to universities across Africa and the world by the end of the year. The *Journal* currently has very successful and well-renowned international editorial board members who have been encouraged to write editorials as

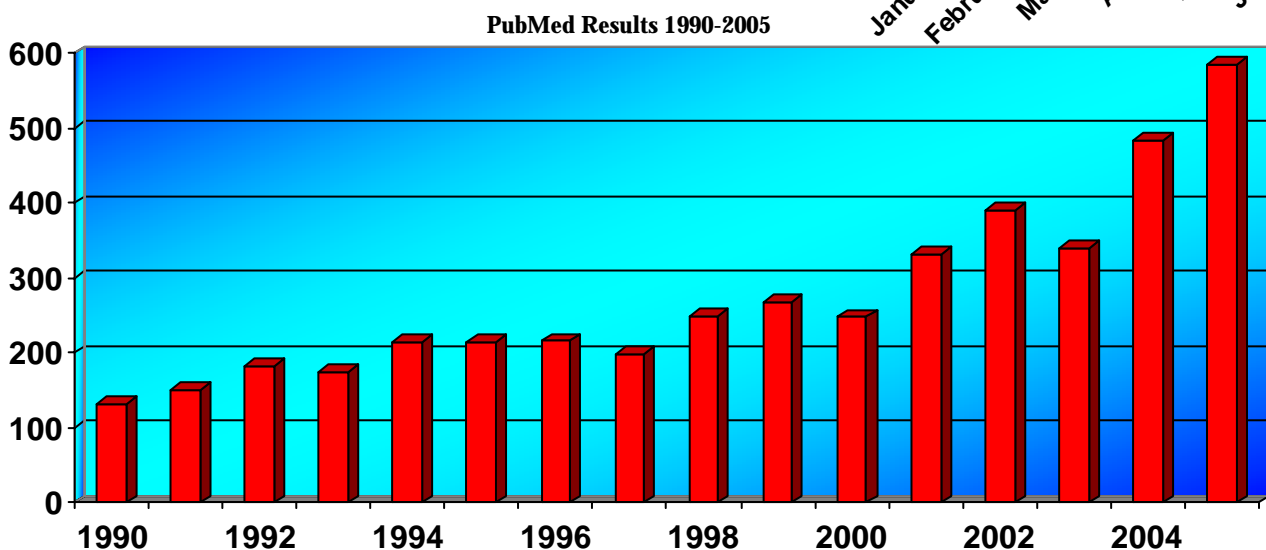
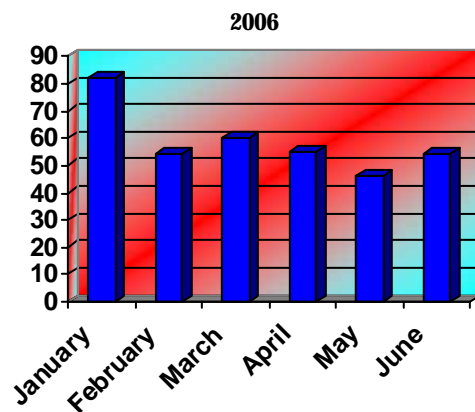
well as papers to highlight the strides made by *Malawi Medical*.

Plans by each of the journals over the next year include hosting training workshops for editors and copy editors, undergoing training on newly received technological equipment, building a business model to enhance sustainability, hosting journal websites to increase accessibility, developing a system that tracks hits and downloads to see who accesses journal articles and from where, including local internships to both support journal operations and to build capacity, and conducting workshops on how to submit articles online. Attaining these goals will help build infrastructure, and as a result of these and other advances, local information will be more readily accessed regionally while each journal becomes a part of the global information network.

GRANTEE ARTICLES REFERENCED IN PUBMED

PubMed is an excellent resource for finding information on grantee publications. The data presented here was compiled by Case Szarwark using the easy to navigate search at www.pubmed.gov. To replicate this search, simply type in TW [gr] OR FIC[gr]. This will produce a list of all the publications by FIC grantees within PubMed's database. To limit your search or search for specific grantees, use the tabs on the top of the search results, and enter in your desired limits. The 'display' feature allows you to sort your results using various criteria, such as date, author and journal.

Last year, PubMed referenced a record 585 articles from FIC grantees (see below). Based on data for this year (at right), this trend should continue.



THE IMPORTANCE OF MATHEMATICAL MODELING

Air travel was facilitated by the use of mathematical models –the Wright brothers calculated lift and drag and used their measurements to modify their basic airplane design. Similarly, mathematical models and concepts have played an important role in almost every area of science, and public health and medicine are no exception.

Mathematical modeling combined with standard statistical analyses provide a powerful set of analytical methods to explore hypotheses about the factors and mechanisms underlying disease and the potential effects of interventions. By providing rigorous frameworks for reasoning, they can help avoid the pitfalls of informal logic, intuition, opinion and purely verbal debate.

One project that the Fogarty International Center at the National Institute of Health is involved in is the Disease Control Priorities Project. DCPD is an ongoing effort to assess disease control priorities and produce evidence-based analysis and resource materials to inform health policymaking in developing countries.

DCPD is an excellent example of using a quantitative approach to support rational decision-making. The project uses models to evaluate the quantitative contribution of disease to morbidity and mortality and determine the cost-effectiveness of intervention alternatives.

Modeling in the Health Sciences

William Harvey applied mathematics to physiology in 1628, combining quantitative reasoning with observation and experiment to ‘calculate the amount of and prove the circular movement of the blood’. In 1766, Daniel Bernoulli developed a mathematical model of the spread of smallpox.

Despite several important scientific advances that combine biology and mathematics and their great potential in public health and medicine for problem solving, the approach remains rare. Consequently, the United States government employs only a very small number of modelers in the health sciences.

“An increase in the number of good modelers and effective use of technology should increase the efficacy and efficiency of research and intervention programs in International Public Health,” stated Ellis McKenzie of Fogarty. The mathematical modelers at Fogarty International Center focus on modeling infectious diseases.

Innovations by FIC researchers regarding the spread of inter and intra-pandemic flu in light of the possible avian-flu epidemic illustrate the significance of modeling as invaluable to government policy.

FIC researchers conclude that the most severe epidemics, such as those caused by the more recently emerged H3N2 influenza virus, spread faster than milder ones. A sophisticated statistical analysis combined with mathematical modeling demonstrated that the distance traveled to work correlates with the sequential pattern of flu better than other factors that were tested.

Modeling Malaria

Malaria is another focal point for FIC modelers. Every year, malaria kills close to two million people and is associated with close to five billion episodes of clinical illness throughout the world.

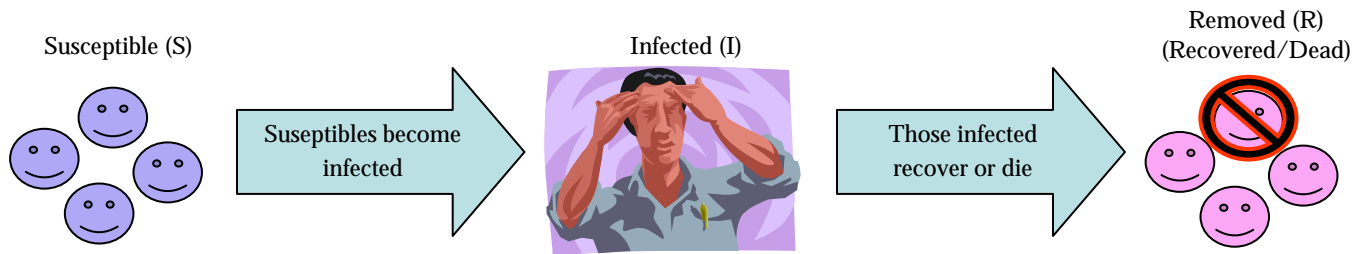
Over 50 percent of the world’s population is exposed to the disease – an increase of close to 10 percent over the past decade. Those living in the most economically deprived areas receive the worst care and suffer catastrophic economic consequences from their illness. Almost three percent of disability-adjusted life years (DALYs) are due to malaria mortality globally, 10 percent of which is in Africa.

Ronald Ross showed that malaria is transmitted by *Anopheles* mosquitoes, and also developed the first mathematical model of malaria transmission. Ross’s models represent the life-cycle of malaria in mathematical form, and quantify the underlying mechanisms and interactions that affect malaria transmission and control.

Ross used his models to arrive at important practical conclusions such as, “to counteract malaria anywhere we need not banish *Anopheles* there entirely...we need only to reduce their numbers below a certain figure.” Ross’ concept of threshold densities of *Anopheles* was tested successfully.

Ross also used a model to conclude that control programs that integrated vector reduction (larvicides), drug treatment (quinine), and personal protection (bed nets) were much more likely to succeed than efforts that relied on just one intervention measure.

Since Ross’s era, others have added more components to models of malaria, leading to insights for more effective prevention and control strategies.



$$ds/dt = -bSI$$

The change over time in # of susceptibles is proportional to the rate of contact (b) between susceptible and infected

$$dI/dt = bSI - aI$$

The change over time in # infected is proportional to the rate of contact (b) between susceptible and infected minus the recovery (a) rate from infection

$$dR/dt = aI$$

The change over time in # of removed is proportional to the rate of recovery (a) from infection.

This model is one of the simplest of all epidemiological models. It is often illustrated in relation to data from a 1978 influenza outbreak in a boarding school. It splits people into three categories— susceptible, infected and removed.

The model quantitatively shows:

- Less contact between those susceptible to the disease and those already infected leads to fewer infections.
- The number of infected individuals decreases faster when the recovery rate speeds up.
- The more people that have the disease, the more people will either recover or die.

This model shows how the disease spreads and therefore allows public health officials to make decisions about how to monitor and prevent spread of the disease. For example, one measure that could be taken is to quarantine those already infected in order to prevent more infections among those susceptible (decrease b). Another measure would be to introduce a drug that speeds recovery (a). Both of these measures work towards the goal of decreasing the number of people infected.

Following in Ross's tradition, researchers at the Fogarty International Center identify many questions about malaria that mathematical models can help us investigate, including:

- How the burden of clinical disease is related to transmission intensity
- How problems in detection and diagnosis can affect drug and vaccine trials
- How the spread of resistance to antimalarial drugs varies with transmission intensity and treatment strategies
- How malaria control strategies might be improved by targeting those who are bitten most
- How combinations of interventions may synergize and show different effects in different settings

Mathematical modeling is applied in many fields. For instance, deciding whether or not to carry an umbrella to work derives from a mathematical model. Jokes about forecasts may not have changed, but meteorologists' ability to accurately predict weather has improved enormously in the past two decades through the use of models.

Similarly, modeling is an increasingly valuable tool in public health. Mathematical Models are useful in determining ways to prevent the spread of disease. They explain which decisions will have the largest impact on outcomes, and they provide comprehensive examinations of assumptions that enter into decisions.

The quantitative data derived from mathematical models combined with already existing ideas and concepts will create better informed and more effective decisions by health science policymakers.

ACROSS THE CENTER

Sonja Madera of the Division of International Relations is participating in the CDC's International Experience and Technical Assistance (IETA) program. IETA is a developmental training program that combines classroom training with field experience, offering qualified public health professionals the opportunity to enhance their skills and apply them in an international public health setting. Sonja is currently working with CDC in Nairobi, Kenya on the President's Emergency Plan for AIDS Relief (PEPFAR) country plan... **Dr. Kenneth Bridbord, Director, DITR**, was recognized by FIC staff for his 35 years of government service. Regarding his service, Dr. Bridbord said, "I am privileged to have had the opportunity to serve in the Federal government for 35 years. Nearly 23 of these years have been with the Fogarty International Center. These years have been, by far, the most gratifying of my career. In this regard, I feel most fortunate to have helped contribute to building sustainable research and public health capacity in low and middle income countries around the world. At the same time, it has been a great privilege to work with so many extremely competent and dedicated people at Fogarty with whom I share this commitment to global health." ... On June 15, a web conference took place to present the accomplishments attained during the first phase of the pilot program "*Virtual Program for Career Development and Capacity Building for Latin American and Caribbean Junior Women Scientists*". Launched in November 2005 to promote junior women scientists' career development in the biomedical sciences in Latin America, this program is a partnership between FIC, NIH, USA, and UNESCO Regional Chair "Women, Science and Technology in Latin America", FLACSO Argentina. Fifteen Latin American Junior Women Scientists participated in the first stage of the program, including Fogarty GRIP grantees and NIH Alumnae. The co-directors of the program are Dr. Ana Chepelinsky, Program Director for the Americas, FIC (email: abc@helix.nih.gov) and Gloria Bonder, UNESCO Regional Chair, FLACSO Argentina (email: catunesco_fic@flacso.org.ar)... **Disease and Mortality in Sub-Saharan Africa** is a comprehensive reference that provides a high-quality epidemiological evidence base for policy makers in Sub-Saharan Africa to identify priorities in health. The volume covers the most common diseases and conditions contributing to ill health in Africa. Topics range from infections and vaccine preventable diseases to the growing burdens of cancer and cardiovascular disease. The second edition of this book was launched by the World Bank and the South African Medical Research Council in June at the Cape Town Book Fair. Editors include Dean Jamison and Karen Hofman both of the Division of Advanced Studies and Policy Analysis at Fogarty. Karen Hofman, Mark Miller and John Sentz contributed as chapter authors.

New Staff

Katie Rouhier joined DASPA this spring as a research assistant, following an internship with US Congressman Richard E. Neal (D) of Massachusetts. She graduated in December 2005 with a B.A. in Philosophy and Religion from James Madison University. **Sarah Kofke-Egger** joined the communications department as a writer. Sarah is a recent graduate of the George Washington University, where she received her B.A. in International Affairs and Global Public Health. **Case Szarwark** is working in the communications department as a summer volunteer. Case is a rising senior at Penn State, where she is majoring in Journalism. **Jessica Hohman** will be

interning for the summer with DASPA. Jessica recently graduated from Miami University where she received her B.A. in Chemistry and History. **Kay Negishi** has joined DIEPS as a summer intern. Kay is a rising senior at Harvard University, studying biology. She will be focusing her efforts this summer on the polio eradication program that was launched by WHO in 1988. **Shobha Sadasivaiah** joins DIEPS for the summer as well. Shobha received her B.A. in Human Biology from Stanford University. She then served as a Peace Corps Volunteer in the water, sanitation and health program in El Salvador. She has also received her Master's of Public Health from UC Berkeley and is currently enrolled in Cornell University medical school. This summer she will be focusing her efforts on the debate on the use of DDT as a strategy for vector control of malaria in the developing world. **Dr. Yesim Tozan** joins EPS as a research associate with the Disease Control Priorities Project. She completed her Ph.D. at the Woodrow Wilson School of Public and International Affairs at Princeton University. Dr. Tozan completed a post-doctoral position with Prof. Jeffrey D. Sachs at the Earth Institute at Columbia University and was a researcher and a project leader for programs such as the UN Millennium Project and the Millennium Villages Project. Her research at the FIC will focus on the analysis of the longer term economic burden associated with neurologic-psychologic sequelae from malaria and quantification of the burden of *Plasmodium vivax* malaria.

DR. MARYA LEVINTOVA



Dr. Marya Levintova has recently begun work in the Division of International Relations, Fogarty International Center, National Institutes of Health (NIH), with responsibilities covering Russia, Eurasia and the Arctic regions. Prior to joining NIH in 2006, Dr. Levintova was a postdoctoral research fellow at the Alcohol Research Group, School of Public Health, University of Berkeley, where she analyzed the impact of alcohol control policies on alcohol consumption and mortality in the Russian Federation. For about 5 years,

Dr. Levintova has been examining health-related policies, legislation, and programs in the countries of the former Soviet Union, in particular focusing on non-communicable diseases. Dr. Levintova is also a recipient of the Fulbright Scholar award for the study of the impact of the demographic changes on health-related legislation and policies in the Russian Federation.

Dr. Levintova immigrated to the United States from the Soviet Union in 1989. She holds a Ph.D. in Clinical Psychology from Alliant University/California School of Professional Psychology, and a B.A. from the University of Redlands. Her research interests include development and implementation of public health policies and legislation; tobacco, alcohol, and drug abuse control, and the interplay of multi-sectoral stakeholders in the policy decision-making process. Dr. Levintova is fluent in Russian and English and conversant in Belorussian.

HOW TO CONNECT WITH FIC STAFF

Do you need to get in touch with the person responsible for a particular program or division within FIC? The chart below provides easy to navigate contact information by program , region or department. All telephone numbers are area code (+1 301) unless otherwise noted.

Subject	Name/Email	Telephone
Africa, Sub-Saharan	Henry "Skip" Francis, M.D.	496-6689
AIDS/TB Program	Jeanne McDermott, Ph.D.	496-1492
Americas and the Caribbean	Ana Chepelinsky, Ph.D.	402-6212
Asia	Tina Chung, M.P.H.	496-5164
Behavioral and Social Sciences Research Program	Kathleen Michels, Ph.D.	435-6031
Bioethics Program	Barbara Sina, Ph.D.	402-9467
Brain Disorders Program	Kathleen Michels, Ph.D.	435-6031
Child Health Research Program	Jeanne McDermott, Ph.D.	496-1492
Communications	John Makulowich, M.A.	402-8614
Drug Discovery and Biodiversity Program	Joshua Rosenthal, Ph.D. or Flora Katz, Ph.D.	496-1653 OR 402-9591
Ecology of Infectious Diseases Program	Joshua Rosenthal, Ph.D.	496-1653
Ellison (Clinical Research Training) Program	Aron Primack, M.D.	496-4596
Environmental and Occupational Health Program	Chris Schonwalder, Ph.D.	919-541-4794
Epidemiology and Population Studies Division	Mark Miller, M.D.	496-0815
European Union (EU)	Elizabeth Ann Davis, D.V.M., M.P.H.	496-6688
Evaluations	Linda Kupfer, Ph.D.	496-3288
Framework Programs	Flora Katz, Ph.D.	402-9591
Genetics Program	Flora Katz, Ph.D.	402-9591
Global Health Research Program	Aron Primack, M.D.	496-4596
Grants	Bruce Butrum	496-1670
Infectious Disease Research Program	Barbara Sina, Ph.D.	402-9467
Informatics Training Program	Flora Katz, Ph.D.	402-9591
Malaria Program	Barbara Sina, Ph.D.	402-9467
Media Relations	John Makulowich, M.A.	402-8614
Middle East / North Africa	Judy Levin, M.S.Sc.	402-1616
Modeling	Ellis McKenzie, Ph.D.	496-0815
Multilateral Organizations	George Herrfurth, M.A.	496-6373
Passports / Visas	Sandra Fuentes	496-3441
Policy Analysis Division	Karen Hofman, M.D.	496-2571
Population and Health Program	Jeanne McDermott, Ph.D.	496-1492
Security Training	Marcia Smith	402-9046
Stigma and Global Health Program	Kathleen Michels, Ph.D.	435-6031
Tobacco Program	Aron Primack, M.D.	496-4596
Trauma Program	Aron Primack, M.D.	496-4596

Fogarty International Center
National Institutes of Health
Building 31, Room B2C29
31 Center Drive, MSC 2220
Bethesda, MD 20892-2220 USA
www.fic.nih.gov



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Managing Editor
John Makulowich
Editor
Sarah Kofke-Egger

Fogarty International Center
31 Center Drive, Room B2C29
Bethesda, MD 20892-2220 USA
+1 301 496-2075
<http://www.fic.nih.gov>

Comments & Corrections to:
ficinfo@nih.gov

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SIR RICHARD PETO LECTURES AT NIH

On July 13, Sir Richard Peto presented a lecture entitled “Halving Premature Death: Is It Realistic?” in the Natcher building on NIH’s campus in Bethesda.

In his lecture, Sir Richard addressed the fact that worldwide, there are currently about 20 million deaths a year before middle age. Death in old age is inevitable, but most deaths before old age are avoidable.

Sir Richard discussed causes that each account for at least a million avoidable deaths a

year before old age, and addressed what can realistically be done to reduce this number. He showed that the pursuit of statistical detail continues to be surprisingly helpful in answering these big questions.

Sir Richard Peto is a fellow of the Royal Society due to his contributions to the discovery and development of meta-analysis, a statistical method for analyzing the results of clinical trials. Peto was knighted for his services to epidemiology. He is currently a Professor of Medical



Sir Richard Peto (painting by FIC Staffer Julie Marquardt)

Statistics and Epidemiology at the University of Oxford, and is the co-director of the Clinical Trial Service Unit.

