Letter from the Director

2015 was a very productive year for the Global Health Economics Consortium. We started our first large collaborative project, a five-year cooperative agreement with CDC on HIV, TB, hepatis, and STIs. We published widely, and frequently in high profile venues. We worked increasingly across disciplinary boundaries, in particular connecting clinical researchers and economists in numerous collaborations. We’re developing economics curricula with major new programs. For details in these areas, see below. We also planned an exciting January 2016 3rd Annual Colloquium, co-hosted by Stanford and UC Berkeley, with participants from across the US and abroad.

Where are we headed? Increasingly, the world of global health economics is becoming integrative. Major substantive questions include: How can considerations such as equity and financial protection be combined with efficiency metrics most effectively? How can we translate assessments of individual interventions into coherent, compelling, and practical plans to deliver a broad package of needed services?

And process questions: How can we coordinate the highly disparate but complementary methods of quantitative economics, implementation science, and behavioral economics? How can we build on initial GHECon successes in developing collaborations to raise our profile and impact?

We’re working on all these issues. Read on, and let us know your suggestions and ideas.

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Why Do Health Economics?
By Elliot Marseille

Health economics is about improving efficiency, effectiveness, and equity. Many sub- and allied disciplines contribute.

A founding principle of GHECon is that a wide range of activities under the general term “economics” can powerfully contribute to global health. Health policy makers confront the daunting task of reconciling the increasing demand for services with funds which are insufficient to support all potentially useful interventions. Achieving greater efficiency should thus be a major goal for program planners and policy makers. Economic analysis, and cost-effectiveness analysis in particular, is widely accepted by researchers and practitioners as important tools for identifying where “value for money” can be found, and thus for informing health sector priority setting via program design and selection. These analyses can also motivate increases in funding, due to better understanding of the range of efficient available strategies.

However, we contend that varied economics sub-disciplines are highly complementary, each making important unique contributions. The application of economic theory and technique goes beyond measuring efficiency. A few examples are:

- **Ensuring access**, especially for vulnerable populations requires understanding and creating financing strategies that foster effectiveness and equity goals.
- **Workforce analysis**—understanding how best to deploy personnel and training resources—supports program and policy implementation. Implementation science provides insights about the way health systems function that can accelerate the adoption of practices found to enhance efficiency and access.
- Finally, the burgeoning **new field of behavioral economics**, at the intersection of psychology and economics, has enormous potential for increasing recruitment and adherence and thus improving the benefits of health programs.

GHECon is committed to providing a forum for collaboration across these diverse activities so that economic analysis in its various forms can achieve its full potential to contribute to global health policy.
New Projects

Below is a brief selection of projects recently initiated by GHECon investigators.

**BEECON—Behavioral Economics for Oral Health Innovation**

US and collaborators at UCLA received a phase 1 two-year planning award from NIH/NIDCR for behavioral economics approaches to improve oral health in Latino children 1–3 years old in Los Angeles. The project will explore effects of incentives to parents to consistently brush children’s teeth. The PI at US is Stuart Gansky in the School of Dentistry, with US collaborators Jenny Liu, Justin White, and James G. Kahn. Joanne Spetz is helping coordinate the initiative across grantees.

**California Respiratory Care Workforce Study**

Under contract with the Respiratory Care Board of California, this study will include a literature review, interviews and surveys with directors of pulmonary care services, analysis of educational curricula currently used to train respiratory care practitioners, interviews with directors of respiratory care education programs, and focus groups with current respiratory care practitioners. Joanne Spetz is partnering with Professor Diane Twigg of Edith Cowan University, Australia.

**Consortium for the Assessment of Prevention Economics (CAPE)**

GHECon was awarded a five-year cooperative agreement of up to $8 million by the US Centers for Disease Control and Prevention (CDC) to conduct economic modeling of disease prevention in five areas: HIV, hepatitis, STI (sexually transmitted infections), TB (tuberculosis), and school health. The team, led by James G. Kahn, MD, MPH, and Paul Volberding, MD, both faculty in Global Health Sciences, is a multi-institution consortium, with 39 investigators across US; Stanford University; UC Berkeley, UC Davis, UC San Diego; the San Francisco Department of Public Health, and Health Strategies International. It is based at the US Philip R. Lee Institute for Health Policy Studies.

**Global Health Cost Consortium**

The Bill and Melinda Gates Foundation awarded an international consortium a three-year award to provide improved estimates of the cost of HIV and TB programs worldwide, and to develop a “reference case” for costing research. The team is headed by Carol Levin of the University of Washington, with participation by US (James G. Kahn and Elliot Marseille), Avenir Health, the Mexican National Institute for Public Health (INSP), the London School of Hygiene and Tropical Medicine, and the University of Capetown. The team will be working with the Global Fund for AIDS, TB, and Malaria, WHO, US PEPFAR, and selected countries as users of this information.

**Multi-Site Evaluation of Innovative Oral Health Workforce Interventions**

This Robert Wood Johnson Foundation-funded program is examining seven innovative workforce models that promote increased uptake of prevention measures and improve access to oral health prevention services. Each model will be evaluated for its effectiveness in promoting prevention and its role in contributing to outcomes. Projects will also be assessed for fidelity to the original model, generalizability and replicability, and for potential sustainability. Joanne Spetz is PI.
Kirstin Bibbins-Domingo was elected to the Institute of Medicine (IOM), a division of the National Academies of Sciences, Engineering, and Medicine. Election to the IOM recognizes individuals who have made outstanding contributions to the fields of health and medicine, and is considered one of the highest honors in these disciplines. Dr. Bibbins-Domingo is a general internist and epidemiologist whose research has focused on minority health and health disparities. She is Director of the US Center for Vulnerable Populations, and serves as Vice-Chair of the US Preventive Services Task Force.

KATHRYN PHILLIPS

Policy and Practice for Personalized Medicine

With funding from National Human Genome Research Institute, Kathryn Phillips is serving as the guest editor for a theme section in Value in Health on “Value to Decision Makers of Evaluations of Personalized/Precision Medicine: Applications to Other Emerging Technologies.” Papers include an analysis of the challenges in measuring the value of digital health technologies, the impact of new payer and care models on value determination, preferences measurement, and integrating data into the EHR. Also under this award, the UCSF Center for Translational and Policy Research on Personalized Medicine (TRANSPERS) is completing initial analyses of its new Payer Coverage Policy Registry, which examines coverage for multi-gene panels and sequencing technologies.

Teaching

GHECon faculty James G. Kahn and Joanne Spetz are taking lead roles in developing health economics modules as part of the new Health Policy & Law masters US-Hastings, and the Global Brain Health Initiative, based US and Trinity College Dublin. Individual US faculty will be invited to serve as content experts and instructors in their areas of expertise.

Publications

Selected

A cost analysis of the American Board of Internal Medicine’s Maintenance-of-Certification Program

In 2014, the American Board of Internal Medicine (ABIM) substantially increased the requirements and fees for its maintenance-of-certification (MOC) program. Faced with mounting criticism, the ABIM suspended certain content requirements in February 2015 but retained the increased fees and number of modules. An objective appraisal of the cost of MOC would help inform upcoming consultations about MOC reform. We assessed testing costs (ABIM fees) and time costs (monetary value of physician time). We found that internists will incur an average of $23,607 in MOC costs over 10 years. Time costs account for 90% of MOC costs. Cumulatively, 2015 MOC will cost $5.7 billion over 10 years, $1.2 billion more than 2013 MOC. The ABIM MOC program will generate considerable costs, predominantly due to demands on physician time. A rigorous evaluation of its effect on clinical and economic outcomes is warranted to balance potential gains in health care quality and efficiency against the high costs identified in this study.

The cost of secondhand smoke exposure at home in California

The economic impact of SHS exposure in the home totaled $360 million in California in 2009, with healthcare costs over $241 million. The most costly conditions for children and adolescents were attention deficit hyperactivity disorder ($7.8 million) and middle ear disease ($5.6 million). For adults, the most costly conditions were ischemic heart disease (IHD) ($130.0 million) and asthma ($67.4 million). Deaths of 821 Californians were attributable to SHS exposure in the home, including 27 infants whose mothers smoked while pregnant and 700 adults who died from IHD. These deaths represented a loss of over 13 000 YPLL and $119 million in lost productivity. Policies that reduce exposure to SHS at home have great potential for reducing healthcare and mortality costs.
Cost-effectiveness analysis of malaria rapid diagnostic test incentive schemes for informal private healthcare providers in Myanmar

The emergence of artemisinin-resistant *Plasmodium falciparum* parasites in Southeast Asia threatens global malaria control. One strategy to counter this problem is a subsidy of malaria rapid diagnostic tests (RDTs) and artemisinin-based combination therapy (ACT). A study in Myanmar evaluated the effectiveness of financial incentives vs information, education and counselling (IEC) in driving the proper use of subsidized malaria RDTs among informal private providers. This cost-effectiveness analysis compares intervention options. Results found that ICERs from the least to most expensive intervention are: $1,169/DALY averted for simple subsidy vs no intervention, $185/DALY averted for subsidy with financial incentives vs simple subsidy, and $200/DALY averted for a subsidy with IEC vs subsidy with financial incentives. Due to decreasing ICERs, each strategy was also compared to no intervention. The subsidy with IEC was the most favorable, costing $639/DALY averted compared with no intervention.

Cost-effectiveness of early treatment of hepatitis C virus genotype 1 by stage of liver fibrosis in a US treatment-naive population

Novel treatments for hepatitis C virus (HCV) infection are highly efficacious but costly. Thus, many insurers cover therapy only in advanced fibrosis stages. The added health benefits and costs of early treatment are unknown. We assessed the cost-effectiveness of (1) treating all patients with HCV vs only those with advanced fibrosis and (2) treating each stage of fibrosis. We simulated 1000 individuals using a Markov disease state model. We found that among patients receiving 8 or 12 weeks of sofosbuvir-ledipasvir treatment, treating all fibrosis stages compared with treating stages F3 and F4 adds 0.73 QALYs and $28,899, for an ICER of $39,475 per QALY gained. Treating at stage F2 (portal fibrosis with rare septa) costs $19,833 per QALY gained vs waiting until stage F3; treating at stage F1 (portal fibrosis without septa), $81,165 per QALY gained compared with waiting until stage F2; and treating at stage F0, $187,065 per QALY gained compared with waiting until stage F1. Results for other regimens show a similar pattern. At base-case drug prices, treating 50% of all eligible US patients with HCV genotype 1 would cost $53 billion. A 46% reduction in cost of sofosbuvir-ledipasvir therapy decreases the ICER for treating at all fibrosis stages by 48%.

Cost-effectiveness of hypertension therapy according to 2014 guidelines

On the basis of the 2014 guidelines for hypertension therapy in the United States, many eligible adults remain untreated. We projected the cost-effectiveness of treating hypertension in US adults according to 2014 guidelines. Results indicated that the full implementation of the new hypertension guidelines would result in approximately 56,000 fewer cardiovascular events and 13,000 fewer deaths from cardiovascular causes annually, leading to overall savings. The treatment of patients with existing cardiovascular disease or stage 2 hypertension would save lives and costs for men between the ages of 35 and 74 years and for women between the ages of 45 and 74 years. The treatment of men or women with existing cardiovascular disease or men with stage 2 hypertension but without cardiovascular disease would remain cost-saving even if strategies to increase medication adherence doubled treatment costs. The treatment of stage 1 hypertension was cost-effective (defined as <$50,000 per QALY) for all men and for women between the ages of 45 and 74 years, whereas treating women between the ages of 35 and 44 years with stage 1 hypertension but without cardiovascular disease had intermediate or low cost-effectiveness.

Cost-effectiveness of using a social franchise network to increase uptake of oral rehydration salts and zinc for childhood diarrhea in rural Myanmar

The objective of this study was to determine the incremental cost-effectiveness of a strategy to promote ORS-Z use through private sector franchising compared to standard government and private sector practices. Based on the model, the promotional strategy would translate to 2.85 (SD 0.29) deaths averted in a community population of 1 million where there would be 81,000 children under 5 expecting 48,373 cases of diarrhea. The incremental cost effectiveness of the franchised approach to improving ORASEL coverage is estimated at a median $5,955 (IQR: $3,437–$7,589) per death averted and $214 (IQR: $127–$287) per discounted DALY averted. Investing in developing a network of private sector providers and keeping them stocked with ORS-Z as is done in a social franchise can be a highly cost-effective in terms of dollars per DALY averted.
Improving access to surgical care could save 1.5 million lives per year in poor countries, according to findings released today by the Disease Control Priorities Network at University of Washington’s Department of Global Health. Essential Surgery, the first volume of the Disease Control Priorities, 3rd Edition (DCP3) series, identifies 44 essential surgical procedures which should be available in low- and middle-income countries. Most of these procedures can be performed in first-level hospitals by multidisciplinary teams of surgeons, anesthesiologists, nurses and other healthcare providers. Investment in first-level hospitals is critical because they are the most important sites for essential surgical care delivery. By providing surgery for road traffic injuries, obstetric emergencies, and common ailments like cataracts, poor countries could gain $10 worth of health benefits for every $1 invested.

**Economic evidence on identifying clinically actionable findings with whole genome sequencing: A scoping review**


The American College of Medical Genetics (ACMG) recommends that mutations in 56 genes for 24 conditions are clinically actionable, and should be reported as secondary findings after whole genome sequencing. Our aim was to identify published economic evaluations of detecting mutations in the general population or in targeted/high-risk populations in these genes and conditions and identify gaps in knowledge. Results: A total of 607 studies were identified and 32 relevant studies were included. Identified studies addressed less than one third (7 of 24, 29%) of the AMCG conditions. The cost-effectiveness of screening in the general population was examined in only 2 of 24 (8%) conditions.

**The economics of preventing hospital falls: demonstrating ROI through a simple model**


Hospital rating programs often report fall rates, and performance-based payment systems force hospitals to bear the costs of treating patients after falls. Some interventions have been demonstrated as effective for falls prevention. The objective of this study was to assess the cost savings associated with implementing nursing approaches to prevent in-hospital falls. Results indicated that falls-prevention programs can reduce the cost of treatment, but in many scenarios the costs were greater than potential savings. Thus, falls-prevention programs need to be carefully targeted to patients at greatest risk in order to achieve cost savings.

**Handbook of Global Health Economics and Public Policy (World Scientific)**

This comprehensive 3-volume set presents the latest in global health economics over a wide range of specific topics. Richard Scheffler of UC Berkeley is the editor, and US chapter authors include Joanne Spetz, Jenny Liu, Justine White, and Kathryn Phillips.

**“How much will I get charged for this?” Patient charges for top ten diagnoses in the emergency department**


Authors examined the charges, their variability, and respective payer group for diagnosis and treatment of the ten most common outpatient conditions presenting to the Emergency department (ED). Results indicated Median charges ranged from $740 (95% CI $651–$817) for an upper respiratory infection to $3437 (95% CI $2917–$3877) for a kidney stone. The median charge for all ten outpatient conditions in the ED was $1233 (95% CI $1199–$1268), with a high degree of charge variability.

**Salary differences between male and female registered nurses in the United States**


Fifty years after the Equal Pay Act, the male-female salary gap has narrowed in many occupations. Yet pay inequality persists for certain occupations, including medicine and nursing. Both surveys showed that unadjusted male salaries were higher than female salaries during every year (NSSRN, $10 775 [95%CI, $10 243–$11 306], P < .001;ACS, $9562 [95%CI, $9163–$9961], P < .001. Male RNs outearned female RNs across settings, specialties, and positions with no narrowing of the pay gap over time. About half of the gap was accounted for by employment and other measured characteristics. This gap is similar in magnitude to the salary differences found for physicians.