

Envisioning the Health Care Initiative

at Lehigh University

September 2008

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Executive Summary

The provision of high-quality health care in the United States and globally will challenge financial, technological, and human resources in unprecedented ways over the next three decades. The cost to the U.S. economy is expected to double by 2015, approaching 20% of GDP (Borger et al., 2008). The social costs of health problems to individuals and families will also be considerable. Lehigh University is uniquely positioned with strengths in the physical, biological, and social sciences, engineering, and education to contribute innovative health care advances that will lead to a successful health care system (Gast, 2008). More than 25% of Lehigh faculty, across disciplines, express interest in health care issues. As an institution without a medical school, Lehigh will not run health clinics, but we can enhance health care quality, efficiency, and accessibility through our research and programs from humanities to engineering.

In spring 2008, Lehigh University President Alice P. Gast appointed a core group of Lehigh faculty to set goals and priorities for Lehigh's response to the growing health care challenge. The Health Care Initiative task force was charged to (a) "integrate and summarize ideas and interests"... (b) "enumerate Lehigh's existing strengths in health-related research and teaching" and (c) "develop a strategy and timelines"... for Lehigh's response to the burgeoning health care crisis.

The Health Care Initiative task force reasoned that a survey of faculty would determine interest and activity in health care research, clarify needed resources and opportunities for new or strengthened initiatives, and provide input for next steps in Lehigh's response. The task force sent an e-mail survey to all Lehigh faculty members, followed up with department chairs and program directors, and conducted small group discussions in areas of high activity (e.g., physical disease, biotechnology, mental health). Faculty responses (120 respondents) were organized into preliminary categories as the basis for discussions on potential "signatures" for Lehigh's future health care efforts.

The resulting discussions, which were broad ranging and fertile, yielded two compelling themes that reflected priorities for future efforts:

- Health Over the Life Course
- Global Health and the Environment

While two main themes were selected by the HCI task force for recommendation to President Gast, it is important to understand that certain overarching areas will be involved, no matter which theme(s) is selected for further development. These include health policy, health

economics, health communication and promotion, involvement with the health care community, emerging technologies, and development of materials and devices. From the survey conducted by this committee, it became evident that many Lehigh faculty members are pursuing research in these areas over a wide range of topics. In our efforts to focus on two general research themes, we decided that individuals with the above research interests could work within both of the themes selected, and they are invited to do so.

Members of the task force also identified a need for an Institute or Center to serve in many roles for the Health Care Initiative. A brief discussion of this need will be found in the section following the descriptions of the two themes. Further, the task force identified a need for flexibility in utilizing faculty time and efforts, gaps in depth or critical mass in signature areas, and areas in which additional faculty with specific skills and backgrounds would enhance research in the theme areas. Finally, the task force also proposes university-wide activities during fall 2008 to help develop the proposed themes on which to focus Lehigh's Health Care Initiative.

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Inventory of Health Care Research at Lehigh University

To determine the number of faculty members involved in health care-related research at Lehigh and the range of disciplines and interest areas involved, we designed a survey (a copy of which is appended to this document). Respondents to the survey included faculty members from all colleges and from most departments within each college. A summary of overall numbers is presented below along with some of the analysis of fields represented, cross-disciplinary clusters, and other trends. A brief summary of instructional programs with a health care emphasis is also presented for reference.

General information regarding the survey: Within an initial weeklong response period, we received 86 relevant responses, a small number of which were from faculty whose interests in health care studies were related solely to their teaching and/or student advising. We followed this initial distribution of the survey with requests for additional information to department chairs and program directors. They replied with many additional names and/or by requesting appropriate faculty to respond to the survey. By the end of July, we had 120 names of faculty members with scholarly interests in health care-related research. Of these, 95 answered the survey and provided firsthand information about scholarly and/or teaching activities: approximately 10 were involved in health care issues only through teaching and/or student advising. 25 additional faculty members, whose names were supplied by others, did not answer the survey. Members of the task force had personal knowledge of the health care-related research interests of many, though not all. A few of these are hires starting in 2008.

From the survey, we estimate that at least 100 Lehigh faculty members (approximately one-quarter of the faculty) have research interests that relate to some aspect of health and disease, the health care industry, or health care delivery. These faculty members are drawn from all four colleges, with the largest number (more than 40 of the 100) drawn from the College of Arts and Sciences. Most of the faculty members whose health care scholarly interests are only tied to teaching are also in CAS. Almost all of the engineering faculty who responded to the survey (22) pursue health care-related research, and a significant number of additional engineering faculty who had not filled out the survey were reported by members of the task force as being involved in health care. In the College of Business and Economics and the College of Education, the number of health care-connected faculty members filling out the survey was smaller (eight and nine, respectively), reflecting the smaller total numbers of faculty in each of the colleges.

Interest areas: We examined responses to health care research questions on the survey to determine whether there were clusters of faculty across disciplines with shared topical interests. We found several small cross-disciplinary clusters, for example in cancer, obesity,

aging, and personal experiences of disease. Not surprisingly, we also found larger-sized clusters within disciplines, such as materials and devices, emerging technologies, and economic policy. The only large-sized cross-disciplinary cluster we identified could be termed “mind, brain, and behavior.” This is a rather broad group, but one that effectively crosses all four colleges, with the most strength in Arts and Sciences and Education. We also identified many possible synergies that we think could be expanded if we can promote a better understanding of the health care-related research currently being done across the university.

Instructional programs: Although we did not dwell on instructional programs, a brief consideration of those currently in existence and those planned but not yet implemented can help to shape any initiative in a way that would have a positive impact on instruction as well as on research. To that end, scholastic programs related to health care areas are briefly noted below, and proposed programs with needs issues are highlighted as such.

Programs that currently involve significant instruction in health care-related studies include: undergraduate degrees in Bioengineering, Biology, Biochemistry, Behavioral Neuroscience, Molecular Biology, Psychology (available, but not required), Chemistry (a subset of the degree options), the subset of 7-year programs that include accelerated pre-med, pre-dental, and pre-optometry, and the new undergraduate minor in Health, Medicine, and Society (HMS). Many other undergraduate programs provide courses that contain health care information, expanding the number of students who obtain instruction in health care areas. Lehigh did not traditionally train large numbers of pre-medical students. In 1982 only 18 students applied to medical school and other health professional programs (e.g. dental school). Ten students were accepted to US medical schools. In 1990, the number had increased slightly, to 26 students applying to such programs, with 19 accepted to medical school. However, development of a strong program in Biological Sciences associated with the current department formation in the mid 1990s, along with the development of the Bioengineering undergraduate program, has resulted in substantial growth in the number of medical school applicants from Lehigh. That increase includes many students who apply after taking time off. For the class entering medical school in fall 2007, 48 students applied to health professional programs. Of those applicants 26 were accepted to US schools (medical, dental, optometry). The largest ever applicant class was for fall 2008 where 81 students applied to health professional programs (63 of whom applied to medical school). Of those applicants, 29 were accepted to US medical schools. For the first time, the dental school applicants went up significantly (with 14 applicants and 8 acceptances). The results for optometry schools weren't available at the time this document was written.

At the graduate level, the only Lehigh degrees with an intentional health care focus are the CBE PhD program in Economics that focuses on health economics, the “Health and Biopharmaceutical Economics” program aimed at students with undergraduate degrees in

science and the Chemical Engineering Department new MS program targeted at the biopharmaceutical industry. Although not intentional, a significant percentage of the graduate students in Biological Sciences obtain a health focus due to their areas of research, and the majority of the distance education students in the MS Molecular Biology distance program enter with a pharmaceutical focus due to their jobs. Subsets of graduate students in other disciplines (e.g., pediatric school psychology in the College of Education) also have a health focus due to their research programs rather than the degree focus.

In addition to the programs already in place, an undergraduate interdisciplinary degree in Health, Medicine, and Society has been proposed (along the lines of the existent minor) and a graduate Bioengineering program with a focus in health care has also been proposed. Both of these programs will require additional hiring to succeed. As is noted in the section describing areas of health care-related expertise needed to facilitate increased overall health care research, there are quite a few opportunities to bring expertise to campus that would facilitate management and staffing of these programs.

Based on our analysis of the survey data and discussions among ourselves and with others, we propose two themes, outlined below, that could serve to direct the Health Care Initiative at Lehigh.

Health Over the Life Course Theme

I. Why Health Over the Life Course?

This theme encompasses both disease and health issues related to aging as well as health issues in development that can even affect learning and contribute to larger social problems. The issues range from specific diseases such as cancer to basic nutritional issues caused by poverty. The theme intentionally facilitates research that crosses traditional disease boundaries. As the population of the U.S. (and the world) ages and as life spans increase, health issues related specifically to aging must be examined in terms of diagnosis, treatment, and healthy lifestyle issues. Critically, the need to develop cost-effective ways of handling these issues must be resolved. Just as importantly, it is becoming increasingly clear that health issues affect the learning and development of children. While this relationship has been clear for some time, recent issues related to obesity, health, and education have been at the forefront of public concerns. In addition to personal health, economic and government policy relating to both disease prevention and treatment are important components of this theme. Grouping research into Health Over the Life Course has the advantage of pooling expertise in a wide range of health and disease states.

II. Why at Lehigh University?

There are multiple ongoing research programs in Health Over the Life Course spanning all four colleges at Lehigh. Across departments and colleges, Lehigh has a number of researchers studying problems related to musculoskeletal diseases, infectious diseases, learning and memory, cancer, obesity, behavior disorders, and aging. Most of these efforts are presently nested within disciplines (e.g., biology or bioengineering). Although few if any of these programs have sufficient resources or critical mass of faculty at the present time, strategic enhancement of these extant programs should lead to greater progress and visibility in several of these areas. Collections of faculty expertise in which Lehigh can approach critical mass include that of Biomaterials and Mechanics, an area that can contribute significantly to both device and drug design and/or delivery, and “Diagnostic Biomedical Devices” (requiring expertise in optics, electronics, and device design). Another such cluster, as mentioned previously, could be called “Mind, Brain, and Behavior.” Within this area could be faculty studying various areas of neuroscience, mental disabilities, and individual experiences of health and disease. In addition, Lehigh has a cluster of faculty members engaged in health care systems research in the College of Business and Economics.

Other research areas at Lehigh that clearly are encompassed by this theme include metabolic diseases such as obesity, diabetes, heart disease, and cancer. Faculty members

from across several colleges study one or more of these diseases using tools as varied as engineering analytical methods and the analysis of patient narratives. A related research emphasis involves the chemistry and structure of new drugs, and the cellular mechanics and chemistry of disease. Another area of research that fits within the theme emphasizes diseases related to development (e.g., attention deficit hyperactivity disorder, Alzheimer's). Faculty research activities in this last area typically overlap with one or more of the preceding areas. Thus, Lehigh already has many faculty members whose research fits into this area. Defining several cross-disciplinary foci within this theme provides a starting point for development of the Health Care Initiative at Lehigh.

III. Student and Curricular Strengths

Lehigh has excelled in providing students with traditional experiences such as engineering internships in industry and laboratory research opportunities in basic science. Students with pre-medical interests have taken advantage of these opportunities through bioengineering and various biology programs. These opportunities have clearly drawn increasing numbers of students. Additional opportunities such as IPD (Integrated Product Development) have brought students from multiple disciplines into interdisciplinary teams focused on finding solutions for industry problems, including those related to health care delivery. Increasingly, Lehigh students are also expressing interest in health care and community careers. While the traditional goal of medical school is still the dream of many students (in fact, more students from biology and bioengineering than in the past), many of our students are looking at allied health professions, public health, the pharmaceutical industry, intellectual property law, and public and government policy as fields in which their interests in personal and community health can be fulfilled. Evidence of this interest includes the large number of students looking for volunteer opportunities and experiential learning options in the community beyond traditional internships and laboratory experiences, and the number of students responding with interest to the survey about the proposed Health, Medicine, and Society program. As our traditional academic programs and cross-disciplinary opportunities allow Lehigh to recruit students with ever-increasing academic potential, the requests for meaningful opportunities to gain medically relevant experience in community and other real-world health care situations also increase.

At the graduate level, Lehigh currently has programs in Biological Sciences, Chemistry, Economics, various Engineering disciplines, Education, English, Psychology, Sociology and Anthropology, and possibly other fields, where at least some of the students focus their programs in health-related studies. A new graduate program in Bioengineering is also planned to start in fall 2009. Many of these graduate students participate in laboratory research in basic science and engineering focused on health care issues, while students in

other health care-related disciplines require community internships and/or access to data. Better connections between Lehigh University research programs and organizations within the community (whether social service, health care providers, for-profit, or governmental) should improve our ability to recruit top graduate students who will see these opportunities as important to their academic success and future careers. For the graduate students involved in laboratory sciences and engineering, enhanced research capabilities and opportunities will provide a similar recruitment advantage.

IV. A Vision for Health Over the Life Course at Lehigh

Four focus areas within this theme make sense to develop. Some of the faculty research mentioned here fits across more than one area, as do a number of the proposed hires. The range of research areas already ongoing and opportunities for enhancement is very large. While this section mentions several examples, it is not meant to be exhaustive.

- *Physical and Mental Disabilities.* Current Lehigh research in the area of physical and mental disabilities includes, for example, engineering of devices to aid those with specific physical disabilities. Research in this focus area also includes basic research in neuroscience, where there is overlap between brain function and functional changes in specific damage situations. A number of research projects focus on the social, physiological, and genetic aspects of specific conditions such as ADHD, sleep disorders, alcohol abuse, etc. There are also several major projects focused on therapy or interventions. Lehigh should build on these existing areas to enhance research. This is one area where the engineering expertise in Bioinformatics analysis of the genetic basis of some disabilities, Biomechanics efforts to treat specific physical disabilities, and modeling skills might be strengthened along lines of research aimed at aiding individuals in maximal functioning despite disabilities. Scholarly efforts in Biomedical Informatics could also enable new models for care and monitoring that may help decentralize care, facilitating movement away from the hospital and doctor's office. In addition, it would be helpful to have scholars in Health Psychology and Neurological Development to complement and extend research already being carried out in several departments. Faculty additions in this area could contribute to the new Bioengineering graduate program as well as to a variety of existing programs across levels and colleges.
- *Experience of Illness and Disability.* Currently, several researchers study the emotional effects of illness on the individual, from the emotional impact of chronic illness to coping with major life events to bioethics approaches to women's reproductive health and pandemics. Scholars in this area also study the relationships between contemplative practice and health. Development of research in this area could be enhanced with

expertise in bioethics and in the history of medicine as well as by expanding the number of faculty who focus on the experience of disability. Faculty hired in this area and some hired in the cluster above would certainly contribute to the Health, Medicine, and Society program and the community outreach activities that are currently being developed.

- *Aging-Related Chronic Health Issues.* This is an area that includes diseases correlated with life course changes. Currently, faculty members across several disciplines from social science to science to engineering study aspects of cancer, vascular disease, and related drug development, and some bioengineers work on improvements in diagnostics and devices related to aging. Some faculty also study aging from a variety of social science and humanities perspectives as well as insurance and health care access issues. Enhancements to faculty expertise in Biomedical Ethics and Epidemiology are vital both for research and for teaching in this area. An epidemiologist would identify emerging health care issues long before they reach general public awareness, and a biomedical ethicist could address the many controversial decisional issues in health care intervention and research. Newly recruited faculty with these interests could collaborate with others in similar disciplines and/or with others across the university. Bioengineers studying specific improvements in diagnostics, devices, drug development and delivery, etc., hired in this area would also contribute to the development of the Bioengineering graduate program. Areas of expertise limited or missing for this cluster are basic science faculty with an aging focus (e.g., faculty members who focus on cancer, heart disease, or Alzheimer's or other dementias). Broader expertise in health economics and health care policy, public health, the history of medicine, health communication, and the political science and sociology of health care would be particularly helpful in enhancing the clusters of expertise found in the departments of Economics and Education and scattered through several departments in Arts and Sciences. Again, faculty members with these research interests are also needed to enhance present instructional and scholarly efforts.
- *Child Development-Related Health Issues.* Currently, there are Lehigh faculty members interested in various aspects of child development and learning beyond those mentioned in the mental disabilities section above. These include health and learning, access to health care, and education regarding healthy lifestyles. Still other projects look closely at the relationship between social environments and a range of disorders, from social adjustment to educational interventions for children. Faculty with a specific disease focus such as obesity are scattered across several colleges. Additional faculty members

studying relationships between health and learning and others studying access to health care from business and policy perspectives would enhance our ability to have an impact in these areas. New faculty members with these areas of expertise would contribute to the Health, Medicine, and Society program, programs in the College of Education, and the community outreach activities that are currently being developed.

Engagement with the local community could be a signature piece of this theme. Specifically, a Health Care Initiative institute or center would offer a focal point presence in the community. While Lehigh University isn't the appropriate organization to manage a health clinic, the institute or center could help the community evaluate health care access needs, help providers and/or companies with scholarly needs, and aid the regional public health bureau with demographic or economic database research. Lehigh students could gain valuable experiences by volunteering at the center and working with clients, participating in community projects organized out of the center, or through internships developed in the collaborative environment. Graduate students in economics, social science, humanities, education, and possibly even engineering programs might use the center as a place in which to make connections to facilitate their research programs. Faculty research across many disciplines could be enhanced through partnerships formed and through access to data, ideas, and even funding from companies.

V. Health Over the Life Course Funding and Programs

In much of the literature, life course references relate primarily to aging, but we envision this theme as including developmental health issues as well. WHO estimates that by 2025 there will be 1.2 billion people over the age of 60. Some of the most critical health issues for older individuals include heart disease, cancer, Alzheimer's and other dementias, and even basic nutrition issues due to poverty. Limited health care for many exacerbates the problems faced by the elderly. At the beginning of the life course, health issues contribute significantly to children's educational success and social/behavioral functioning, and both are limited by access to health care and by financial and environmental barriers to living a healthy lifestyle.

Funding for scholarly research in these areas tends to be located in specific life course segments, such as funding by the National Institute on Aging for aging biology, neuroscience, and behavioral and social research, the National Institute of Child Health and Human Development, as well as disease-specific focal areas (e.g., National Cancer Institute and American Cancer Society). The FY 2008 budget request by President Bush for the National Institute of Mental Health alone was \$1,504,421,000--clearly indicating significant funding for the first focal area within the Health Over the Life Course theme. Recent NIH announcements include the biology of aging, influences of obesity on educational success,

and other funding aimed at health aspects of child development. In addition, venture capital aimed at drug, device, and diagnostics development is increasingly available as pharmaceutical companies look to outside sources for basic research and new ideas.

Many research institutes and programs focus on single foci in the plan above or on the aging portion of the life course. However, the first few listed below are most like the organization we propose that would include mind, brain, and behavior; aging; diseases; development; and family health, etc. Additional colleges of public health have community and public health research institutes not listed below. Examples of the more focused institutes are grouped by type. Clearly, Lehigh has the opportunity to fill a niche with a Health Over the Life Course research center or institute.

Research Institutes, Centers, and Departments

Cornell University Bronfenbrenner Life Course Center

Research Institute for Life Course Studies, Keele University, UK

Mind, Brain, and Behavior, Princeton

Mind/Brain/Behavior Interfaculty Initiative, Harvard University

Duke University Institute for Brain, Mind, Genes and Behavior

Shelby White and Leon Levy Center for Mind, Brain & Behavior at The Rockefeller University

Center for Mind, Brain and Learning, University of Washington

Center for Population Health and Aging, Penn State Social Science Research Institute

Institute for Health and Aging, UCSF

Buehler Center on Aging, Health & Society, Northwestern University

Institute on Aging, UNC

U Penn, Medicine, Institute on Aging

University of Washington, Institute on Aging

The Center on Aging, Health and Humanities, George Washington University Medical Center

The Institute for Brain Aging and Dementia, UC Irvine

Global Health and the Environment Theme

I. Why Global Health and the Environment?

The impact of globalization on health is increasingly evident in myriad ways, from the rapid worldwide spread of HIV/AIDS and tuberculosis, to worries over a major flu pandemic, to concerns about diseases spread in the global food market, to the increasingly universal problems of providing adequate medical services to growing and aging populations around the world. Major environmental changes such as climate change will have heavy impacts on health problems around the world, including spreading what were formerly tropical diseases into temperate regions. Health effects from environmental pollution, contamination of air and water supplies, drought, and radiological and toxic chemical exposures also confront populations around the world. Profound demographic and environmental shifts, including an increase in the proportion of populations over 65, a tremendous loss of reproductive-age adults in countries most affected by AIDS, depletion of water and fuel supplies, and massive migrations due to employment-seeking, wars, and political conditions, are presenting enormous new challenges in every country in relation to health and the environment. These issues, which affect healthy living and health care, require a broad range of approaches, including environmental management, lifestyle education, the economics and policies of disparate health care systems and their functions within very different countries, and cost-effective improvements in medical care and treatments that can be effective in developing nations as well as in the developed world.

Although traditional funding in health areas has not focused on global health issues, resources are increasingly being directed specifically at these areas. One significant example is the Gates Foundation, which has two main areas of interest in global health:

- “Access to existing vaccines, drugs, and other tools to fight diseases common in developing countries”
- “Research to develop health solutions that are effective, affordable, and practical”

These areas of interest span a range of disciplinary efforts, from engineering more affordable health care solutions (portable devices, less expensive drugs, etc.) to making the economics workable in poor countries to improving health through appropriate global development.

II. Why at Lehigh University?

A unique opportunity exists at Lehigh to combine interests in three major interdisciplinary efforts to work on this issue: the Globalization and Social Change Program, the Environmental Initiative, and the Health Care Initiative. Parts of each of the three main

sections of the Globalization and Social Change Program would interact well in the HCI effort: For example, international responses to HIV/AIDs or disasters are listed under the Global Communication subprogram; the role that poverty and inequality play in diseases is part of the Policy and Social Structures subprogram; and people's interactions with technology and with migration are involved in the Culture and Identity subprogram.

Environmental change is a major research effort of the Environmental Initiative, including scientific and engineering research on climate change issues plus social science studies of various environmental policy issues. Energy use, and its impact on human behavior, is emerging as another major interdisciplinary area for the EI. Environmental policy and communication issues that have been studied relate to environmental health problems in numerous ways.

Faculty members in engineering and basic science are currently involved with relevant technologies; the engineering of more portable and less expensive diagnostic and treatment devices, integrating basic science, patient needs and new technologies, studying basic biological mechanisms, and developing new drugs. Faculty members in Business and Economics and Education also already have some scholarly programs that address global and environmental health care issues and are expanding their global efforts.

Developing this theme across Lehigh University would require ramping up the scientific and medical research on infectious diseases as well as redirecting more of the environmental and global studies toward a health perspective. Significant investment would be required for Lehigh to become a player in the broad area of global health. Building research programs in this area would inevitably support the AAUP/CDC national educational goal to incorporate public health education in the undergraduate classroom ("The Educated Citizen and Public Health").

Currently, individuals and groups at Lehigh have studied or are studying a number of issues that are relevant to this topic, including:

- Several infectious diseases and diagnostic devices to detect them
- The role of risk assessment in postwar environmental health impacts, particularly in the Balkans region
- Health impacts resulting from climate change in the Arctic
- Air and water quality and policy studies
- Sustainable engineering for arsenic-contaminated drinking water in the Indian subcontinent
- Engineering methods to clean polluted groundwater using nanotechnology applications
- More effective ways to communicate about environmental health risks in Asia and the Pacific

- Social, spiritual, and psychological practices primarily focused on Chinese methods
- Comparative health care systems, policies, and funding

III. Student and Curricular Strengths

A strong and growing student interest in health careers exists at Lehigh, including public health, health and hospital management, pharmaceutical business, and various health professions such as medicine and dentistry. Increasingly, these students are looking for health-related experiences in the Third World and in other areas of the globe. In addition, a growing number of courses that address global health and environmental issues have been added to our curriculum. The graduate programs in the College of Education, the College of Business and Economics, the College of Arts and Sciences, and the planned Bioengineering graduate program all train, or plan to train, graduate students who could benefit by the expansion of research in the area of Global Health and the Environment.

A number of key related programs, several of which are fairly new, are helping to recruit high-quality students with health-related interests:

- Bioscience and Biotechnology Initiative including programs in Biology and Bioengineering
- Environmental Initiative
- Globalization and Social Change
- Health, Medicine, and Society Minor
- Health and Biopharmaceutical Economics Program
- Science and Environmental Writing Program
- Science, Technology, and Society Program

IV. A Vision for Global and Environmental Health at Lehigh

Given the breadth of the theme and the paucity of faculty research focused on global and environmental health concerns, developing this theme would require significant focused investment. We envision several clusters of faculty within this broad area. New faculty members would be recruited to fill scholarly niches and contribute to existing and planned educational programs.

- *Technology Enhancements.* This cluster might be composed in part by faculty members hired in the Biotech cluster to work on diagnostics, drug development, and/or device development, particularly with the perspective of improving cost/benefit ratios and/or reaching global markets with point-of-care diagnostics, drugs with better shelf stability, etc. Within the list of those faculty expertise areas we feel are important to add are

several that could contribute to this area (e.g., Mechano-Biology, Cellular and Molecular Bioengineering, Drug Development).

- *Global Health Care Systems.* A second cluster would be policy, economics, and communication scholars who study health care systems, particularly with regard to issues involving cost containment, adaptation to societies with limited access to health care, and communication issues to improve healthy behavior. Again, within our list of needed faculty expertise are areas that could contribute to this cluster (e.g., Medical Anthropology, Epidemiology, Public Health, Bioethics, Marketing and/or Management and Health Communication, particularly in the area of Web Health Communication).
- *Infectious Diseases.* Currently, Lehigh has several faculty members interested in aspects of infectious disease that are important locally and around the globe. Development of this area could include new hires in epidemiology, bacterial or viral evolution, development of new antibiotics, etc. Global epidemics and the resulting stresses on societies and governments could be interesting topics for bioethicists, political scientists studying health care issues, health care systems scholars, and even mathematicians interested in modeling aspects of an epidemic. Connections could also be made with those who will become part of the Policy and Social Structures Program in the Globalization and Social Change Program.
- *Environmental and Social Factors Contributing to Health and Disease.* Currently, Lehigh has faculty studying various water safety issues around the globe, and expansion of this area in the health direction is one way the programs could be synergistic. Another important area where environment and health intersect is that of air pollution, and Lehigh currently has faculty members interested in these issues. An example of such an interaction might be seen in increased traffic and casino development in Bethlehem, and how that links with similar issues elsewhere around the globe. A related area, but one that is not being researched as yet at Lehigh, is a fruitful area of study that would require a new hire; namely, the global health consequences of climate change. Development in this area would add a new dimension to the current Lehigh EI and EES research on ecological responses to climate change. Environmental Health also deals with effects of environmental social policy on health issues, and an Environmental Health hire could well be in areas of environmental policy or law. Such a hire would again facilitate interactions between the three initiatives.

A way to make this program unique and visible would be to link some of the new research to a Lehigh hub (proposed for Global Lehigh) and/or to study abroad. In addition to the limited number of Lehigh faculty members now engaged in global or environmental health research, this proposal carries the expectation that faculty members will be able to bridge initiatives

and/or programs and still contribute to traditional disciplines. Clearly, faculty would need to carefully manage their time and energy and would almost certainly have one primary program focus rather than several. However, we see real opportunities to link these initiatives together and enhance, rather than detract from, the various initiatives.

V. Global and Environmental Health Funding and Programs

USAID estimates that environmental factors are involved in 15 to 18% of child deaths, and malaria is responsible for 2.5 million deaths each year. Efforts by this organization are primarily aimed at government and international organization projects designed to address these issues. Although we think about the Centers for Disease Control and Prevention (CDC) focusing on health in the United States, that organization also has a major focus on global environmental health issues and supports efforts to help other countries improve environmental health. The Institute of Medicine, which is part of the National Academies, hosted a Global Environmental Health Conference in October 2007. The goals were to identify research gaps with a focus on providing water, sanitation, and hygiene to improve health. In summary, a wide range of organizations see global and environmental health issues as major priorities.

Beyond the Gates Foundation work mentioned previously, there are numerous other agencies funding projects in these areas. “NIEHS Extramural Global Environmental Health Portfolio: Opportunities for Collaboration” was published in April 2008 by Christina H. Drew, et al., from the Program Analysis Branch, Division of Extramural Research and Training of the National Institute of Environmental Health Research in Triangle Park, North Carolina. They note: “Global environmental health has emerged as a critical topic for environmental health researchers and practitioners. Estimates of the environmental contribution of total worldwide disease burden range from 25 to 33%.” The report examined NIEHS grant research databases for the past three fiscal years (2005–2007). Over that period, the NIEHS funded 57 scientific research projects in 37 countries at an estimated cost of \$30 million. They recommend additional funding.

NIH funding increasingly covers research across many of these global health issues; for example, \$164 million was devoted in 2007 to health effects of climate change. The National Institute of Infectious Diseases also has a major funding program aimed at global infectious diseases, HIV/AIDS, malaria, and tuberculosis, with approximately \$3,052 million devoted to infectious diseases, \$2,913 million to HIV/AIDS, \$140 million for malaria and malaria vaccine development, and \$183 million for tuberculosis and TB vaccine development in 2007 alone.

The above examples provide a brief idea of available funding for Global Health and Environment research and an estimate of the financial impact of this field. In recognition of

the importance of research in this area, numerous global health institutes and programs have been developed at various institutions. A short list of some of these follows. They are primarily programs associated with medical schools and schools of public health. There also are a number of Environmental Health research programs at U.S. universities.

Research Institutes, Centers, and Departments

Duke Global Health Institute

Global Health Sciences Prevention and Public Health Group, UCSF

Emory Global Health Institute

Vanderbilt University School of Medicine Institute for Global Health

Johns Hopkins Center for Global Health

Sparkman Center for Global Health, UAB

Institute for Global Health and Infectious Diseases, UNC School of Public Health

University of Washington Department of Global Health, School of Public Health

Basic Requirements to Support Ongoing and Increased Health-Related Research at Lehigh

General resources for research

A number of issues were identified both by task force members and through the survey and discussions with department chairs and faculty members; these issues would have to be addressed to help strengthen health care research, enable it to grow and become more interdisciplinary, and eventually become a vital research area for Lehigh. This section reports on issues also identified in the Strategic Thinking process. It represents important resource issues for health-related research at Lehigh regardless of the Health Care Initiative theme chosen.

1. Flexibility in faculty assignments (subject to needs of home departments/divisions)

Providing flexibility to faculty members to pursue research was a major theme that came out in the Strategic Thinking process. It facilitates collaborative research, travel to examine documents and obtain data, etc. However, it also facilitates simple enhanced opportunities to concentrate on research within particular time periods. Three separate examples came up in Strategic Planning that would certainly be helpful to faculty involved in health care research:

- a. Flexibility in teaching to focus it in one or the other semester, pending approval of and workability within home departments
- b. More frequent and/or flexible sabbatical leave
- c. Support for the development of collaborative studies, application for outside funding, etc., to encourage enhanced/additional/collaborative research

2. Seed money

Seed money was also an issue raised in the Strategic Thinking process. We list several specific ways seed money would be very helpful in promoting health care research:

- a. Money for preliminary studies for new and/or collaborative projects--could be larger amounts for collaborative work
- b. Bridge funding for individuals who require significant dollars for their scholarly work and are "between" grant awards
- c. Summer support for the same
- d. Entrepreneurial funding to encourage work in translational areas--could be either seed money or "loans" with conditions, including some "payback" for larger chunks of money
- e. Support to help faculty develop interactions with companies for support and/or Ben Franklin-type funding

- f. Support to bring scholars on sabbatical leave to study at Lehigh University
- g. Resources to develop a seminar series with nationally known scholars in the broad field of the Health Care Initiative.

3. Graduate student recruitment

Part of what brings graduate students to a university is access to opportunities and personal recruitment. Increasing the visibility of health care research at Lehigh with shared public relations and advertising as well as some interdisciplinary opportunities could be recruitment pluses.

Some possible areas include:

- a. Increased stipends for TAs and fellowships to make these positions more competitive
- b. More graduate fellowships for health care areas of research
- c. Recruiting better graduate students to help enhance faculty research in all fields; in some disciplines, graduate student productivity directly impacts faculty productivity (e.g., science and engineering), while in other disciplines, quality students require less intensive remedial supervision, allowing faculty time to devote to their own research (e.g., humanities)
- d. Visibility and marketing both internally and externally to help small and/or new graduate programs to develop (e.g., the MS program in Health and Pharmaceutical Economics)

Resources that would specifically support and enhance health care research

4. Need for an institute or organizational structure with staff

There was frequent discussion among task force members about the need for an overarching organization such as a center or institute to provide stability and encourage interdisciplinary approaches to health care research. In addition:

- a. There also needs to be an oversight group to provide outside assistance and advice on health care initiatives. (Possibly, the current oversight group that covers bioengineering could be changed to meet these needs.)
- b. The proposed overarching organization should have funding that could be used to bring visiting scholars to organize and run seminars, to facilitate interactions with community organizations and local companies, etc.
- c. Interdisciplinary seminars on a specific disease could foster interactions between faculty in different disciplines, e.g., a course for seniors and graduate students on obesity and/or diabetes with faculty from various disciplines team-teaching the class. Potential positive impacts can be envisioned for research as well as the teaching outcome. This would be a perfect type of senior seminar for the planned HMS program.

- d. Support staff would be needed for a number of activities: to facilitate interactions between scholars; support student involvement in the community and community fellowships; facilitate data acquisition (data sets) to support data analysis facilities; interface with possible funders and funding support offices on campus such as ORSP and Development; schedule programs, etc.
- e. Support staff would also be needed for facilities management, including the facility planned for bioengineering and interdisciplinary research.

This overarching structure would also provide a gathering place where faculty members from various disciplines could meet and work on ways of better connecting faculty whose offices and laboratories are on Mountaintop with the faculty on the Asa Packer Campus.

Community Interactions--Student Placement in Communities

Many faculty would benefit by coordinated interactions with health care providers, the health care industry, patient populations, public health groups, etc. It would help to have coordination support through an institute or center (see above). The appointment of a community outreach coordinator with health care expertise would help unify and streamline our partnerships with local health care providers by creating memorandums of understanding, identifying research opportunities, expediting necessary paperwork, etc. Such a coordinator could also facilitate student placement in the communities, coordination with volunteer activities, and coordination for experiential learning, thus saving faculty countless hours that could be directed to research. Management for multiple health care-related disciplines would improve access for our students, since places like the hospitals wouldn't be dealing with many individual faculty members or different administrative offices for each discipline. This is another possible part of an institute's function.

Patient Populations

Many of the programs involved in health care research require direct or indirect access to patients and/or records. We raise here the general issue that shared help in accessing patient populations is something that would facilitate research for many Lehigh University faculty members. One of the major issues is that of data sets: getting them, using them, sharing them, data analysis methods, staff help, etc. Staff with data mining expertise would be particularly helpful. Coordination through an institute or center would help improve both access to databases and potential collaborations among those using the data.

Facilities

While not described in detail, it must be mentioned that facilities, including properly equipped space, appropriate modern equipment to facilitate the research needs, and resources to maintain that equipment will be crucial to the enhancement of the science and engineering

aspects developed as part of the Health Care Initiative. Some of the specialty equipment that might be needed is in place – including equipment in the Genomics facility, Microfabrication in the Center for Optical Technologies, and Electron Microscopy in the Center for Advanced Materials and Nanotechnology. It will be critical to build, equip, and maintain the planned Biotech facility as well as other space and equipment as needed for faculty members hired.

University Support (ORSP, Development)

Health care research has both major governmental and many small (industry and private charitable groups, e.g., American Cancer Society) funding opportunities. Currently, ORSP does not have sufficient staff, expertise, or knowledge of these various smaller opportunities, or the time and/or ability to support faculty who are exploring new avenues of research support. Limited resources are compounded by the recent loss of several individuals who had significant experience and expertise. The Development Office also has limited experience, and limited success to date, in raising money for health care-related research both in terms of fund-raising from our graduates in medical fields and in terms of identifying foundations that would be interested in health care scholar programs and research. Ongoing funding for the items below would be particularly helpful for term-endowed professorships to help recruit the most talented faculty as well as support to help faculty link with local companies to apply for Ben Franklin and related start-up funding.

Intra-Group Seminars

During the planning stages this summer, not only did we find more faculty with scholarly interests in health care-related areas than any of us anticipated, but we also found a range of scholarly expertise in areas many of us did not know existed at Lehigh. We believe that funding for specific targeted seminars in various areas of the program could facilitate development of collaborative research programs. Two types of seminars are envisioned. One is seminars by outside speakers with cross-disciplinary research. A second type of seminar would bring together Lehigh faculty across traditional disciplines, but with shared scholarly interests. For example, we could bring together Lehigh faculty with interests in obesity from across at least three colleges. This type of seminar would serve to better inform faculty at Lehigh regarding expertise that exists at the university and would help encourage cross-disciplinary research, and even course development.

Discipline Coverage for Faculty in Interdisciplinary Programs

One of the big strains being felt in a number of departments in Arts and Sciences is the interest of their faculty in some of the interdisciplinary programs being developed (e.g. Global Studies, Environmental Studies, Women's Studies, and now Health, Medicine, and Society, among others). While these programs provide interesting scholarly connections and exciting teaching opportunities, they make coverage of existent disciplinary courses and programmatic

responsibilities difficult. Simply providing adjunct funds is not an ideal way to cover course needs even short term, and it definitely weakens programs over the longer term. Further, the adjunct mechanism provides no help in maintaining regular departmental programmatic needs for graduate students, etc. The same issue has arisen in the Engineering College with relationship to the Bioengineering program.

Visibility

Last, but not least, is the need to improve internal and external visibility for Lehigh research in areas of health care. We have already initiated the introduction of a Web page for this area, but we definitely need to do more than simply have a Web presence. As with many of the other issues that are specific to health care, maintaining a Website, facilitating communications and interactions with community health groups, and developing interaction opportunities within the university will help improve synergy and research opportunities for those with scholarly interests in health care.

5. Specific faculty expertise needs to facilitate research currently in place

This list contains faculty expertise that would be important to the overall research in health care. In many cases, a particular link between these areas of expertise and the themes described above is clearly identified in the theme discussion. However, this list does not contain a one-to-one correspondence between the brief descriptions in each theme and the more detailed research descriptions discussed below.

Aging (and/or development): A faculty member who studies some basic aspect of aging or development who would be able to share basic information and/or collaborate in the field with people in other disciplines would greatly enhance our ability to do research in this broad area. Currently, many faculty members on campus are studying diseases of aging, policy, and politics; similarly, others study various aspects of childhood health and development. Examples of people who would fit this characterization include someone studying the biological basis of Alzheimer's, specific aging or health aspects in the general population of seniors, or specific psychological or sociological properties of health issues in this group of people. If Lehigh decides to develop its health care research in the area of Health Over the Life Course, a faculty member in development would also be an important hire.

Additional bioengineers: Plans in the Bioengineering cluster supporting the Bioengineering program are for several additional hires to support development of the graduate program. Specific areas of expertise are not yet finalized. Our hope is that coordination between the Health Care Initiative and the Bioengineering cluster will help select specialties that fit into the theme chosen for development. For both themes, we expect that additional strength in novel

biomedical devices will be necessary. Other areas that need to be strengthened for either theme are in information science, modeling, and computation.

Cellular and molecular bioengineering: Someone with this expertise could study bioprocess engineering, stem cell engineering, bioenergy, or cellular tissue engineering. As with the other engineering hires, someone with this expertise will play a critical role in teaching in both the undergraduate Bioengineering program and the planned graduate Bioengineering program. A search is expected this year.

Drug development: While a few faculty members at Lehigh are involved in some aspect of drug design or development, it is an area that would help us link more effectively with companies in the area and compete for Ben Franklin and numerous other funding sources. Drug development is also a good match for institutions without a medical school. Faculty positions with such interests could be in Chemistry, Chemical Engineering, or Biology and possibly elsewhere in the university.

Environmental health: Currently, we have people with tangential interests in this area, but someone with an environmental health focus could collaborate with a number of current faculty members in both health care and in the Environmental Initiative. Such a hire would allow us to begin bridging two major initiatives for Lehigh.

Epidemiology: Expertise in epidemiology could have a home in many different disciplines. We didn't have a preference, nor do we think this person needs to be focused on a specific disease. He or she could find a home in many different departments, and their expertise might be coupled with that of other faculty members noted below. Epidemiology is an area of expertise that would greatly enhance teaching and research in many areas represented in the health care discussions. Particularly, we see possible synergies with people in infectious disease areas as well as within obesity, cancer, and heart disease areas.

Ethics: Lehigh University is woefully understaffed in the field of Bioethics. Almost all aspects of health care have ethical issues, and having one or more scholars with this expertise would significantly help faculty with health care-related research at Lehigh. Despite having two faculty members who teach the bioethics course, neither is really a trained bioethicist, though one does some research in the area. In addition, both have a large number of other demands on their time. The bioethics course is always oversubscribed, even when taught at 7:55 a.m. or at night. Clearly, we have a high student interest in and need for additional teaching in this area. An ethicist is high on the list of faculty expertise needed to allow the HMS program to move from just a minor to a major. Faculty with this area of expertise could also contribute to the development of HMS.

Health communication with Web specialization: The Internet is a major source of health information for patients, doctors, hospitals, etc. According to an August 2008 Harris public opinion poll, 160 million people went online for health care information in 2007. The Web has dramatically changed the way in which people determine healthy behavior, learn about drugs, find doctors, etc. The amount of available information is overwhelming. Who uses it and how are questions being asked by faculty in business, social sciences, and humanities, along with those developing devices and drugs. A faculty member with expertise in this field would be able to communicate with many different disciplines. As with many other positions discussed in this document, a faculty member with this expertise could definitely contribute effectively to the HMS program.

Health psychologist: A faculty member with this expertise could collaborate with and/or serve as a resource for many faculty members in many areas of health care-related research. In addition, courses in this area are currently very popular and are taught only by an adjunct, making such a hire particularly helpful for current disciplinary programs (Psychology and Behavioral Neuroscience in particular). In addition, he/she would help staff the psychology department that currently trains a very high number of majors, a significant number of whom are interested in careers in some aspect of health care. This hire would also help to support the HMS program.

History of medicine: This is a central field for health care studies in the humanities and social sciences and an area in which Lehigh used to maintain expertise. Medical historians offer a crucial perspective for understanding individual and social experiences of health and illness by researching, for example, the ways in which diseases and treatments are defined and modulated in culturally and historically contingent ways. Such a perspective offers insight into current assumptions about health, the body, illness, and health care. Depending on the particular research focus, a number of research areas would be positively impacted by such a hire (women's health, infectious disease, physician-patient relationships, obesity, medical technology, etc.). A medical historian would also positively impact development of the HMS program.

Infectious diseases: Infectious disease expertise in biology is limited. A microbiologist is currently being recruited. To facilitate health scholarship at Lehigh we could use at least one or two more individuals with research programs in virology, immunology, etc., particularly if we are to have a presence in this field. This is important for links to drug development programs, global health issues, etc. Basic science faculty members doing Infectious disease research are easy to find at a medical school, but may be more difficult to recruit to Lehigh. However, the expertise of scholars working in this general area, even if not directly focused on a specific disease, would certainly enhance collaborations in research with other faculty on campus

interested in specific diseases, but from nonscience disciplines. In addition, courses in infectious disease areas are high-priority classes for students wishing to attend medical school or with interests in bioengineering, the pharmaceutical industry, and other areas of health care. Our bacteriology class (currently being taught by an adjunct) is crucial for students who want to enter many health care professional programs (not pre-med). So hiring in this area would have multiple advantages and contribute important aspects to undergraduate programs.

Marketing and/or management: Faculty in either business discipline with a health care research focus would help to broaden the business perspectives in health care. Economics currently has a number of faculty members with research efforts in this area, but whether there is sufficient faculty expertise in the other business departments to help support a broad health care initiative with either of the chosen themes is less clear.

Mechano-biology: Someone who studies structural biology, cellular/molecular/tissue mechanics, and fluid/solid mechanics is a critical link between device people and those studying biological function. A person with this expertise might have a disease or organ focus. Someone with this expertise would also support a critical piece of the instructional mission in both the undergraduate and graduate programs in Bioengineering. A search is expected this year.

Medical anthropologist: This person could collaborate with a number of faculty members across the range of the health care research span. The research range in this discipline is fairly great and we could focus the hire somewhat, depending on the direction the initiative takes. A person with scholarly interests in this area could increase our presence in terms of global health, another nice bridge between disciplines. This area of expertise would contribute significantly to the HMS program. Among other things, he/she could contribute to the breadth of the Health Humanities portion of the program.

Medical sociologist: A person with this expertise could be an epidemiologist, although that would not have to be the case. This expertise is critical to help with the community interaction issues that have been a regular theme of the discussion. And, as with several other faculty members noted above, he/she would be a contributor to the HMS program.

Musculoskeletal research: This scholarly field might be an overlap with physical aspects of aging, and we thought a faculty member with this expertise would contribute to cross-disciplinary work with a number of faculty members in materials and devices. This person might have expertise that would contribute in Bioengineering, but he/she could also be a basic scientist.

Neurophysiologist: Several areas of neuroscience could be expanded in development of the Health Over the Life Course theme. Neurophysiology is one of those areas where individuals

with expertise could collaborate effectively with a number of other faculty in various aspects of neuroscience currently at Lehigh. He/she could focus on a specific developmental area, a specific disease issue, or various aspects of synaptic transmission.

Political science of health care: Options for this position might include expertise in public health, national health care/government policy, or others. While health care policy is a major issue in politics, our faculty expertise in this area is limited. Hires in this area would link very effectively with our faculty expertise in Health Care Economics. Further, this would be a natural bridge that would lead at least some students to make a link between the dream of being a doctor and the practicality of other health care-related fields. A search in the political science department is underway this year, with scholarly work in the area of health care as one possible field of research. Expertise in one or more of these areas would also be very helpful in developing the HMS program.

Public health: We do not anticipate that Lehigh would wish to develop a public health program, but we believe that some faculty expertise in public health could provide significant support for faculty studying many aspects of health care, from device development to community health to health policy or economics. Such a person could live in many different departments depending on the slant taken in defining the position and the department(s) interested in adding this expertise. This person could also collaborate with faculty in the Education College on a variety of issues that link public health and education. A faculty member with this expertise would be a likely leader in the HMS program and might be particularly effective in helping to design and manage an internship component for that proposed HMS major.

Opportunities based on hires suggested above

Increasing the number of faculty in health care research (specific examples above) can help support the HMS program development along with other ongoing undergraduate programs and would greatly enhance our ability to support students doing experiential learning in the community. In addition, both current graduate programs in many disciplines as well as the proposed graduate program in Bioengineering would be enhanced by many of the hires. Many hires proposed within Social Sciences and Humanities with the expertise noted above will see HMS as a true scholarly home, while others might teach in the field but see intellectual homes within traditional disciplines or other interdisciplinary programs. Because a number of the proposed faculty hires do have an affinity for interdisciplinary programs, it will be critical to define clearly their responsibilities across these lines, an issue defined in the Strategic Thinking process. Depending on the themes Lehigh decides to develop in the health care area, some of these topics of faculty expertise will be more critical than others. Specific examples are noted in each theme section. Some of these faculty research fields could also support the Global Lehigh

and or Environmental Initiatives in the classroom, scholarly interests, and/or study abroad areas.

Next Steps in the Health Care Initiative--What to Do in Fall 2008

The Health Care Initiative white paper provides two broad themes to focus advances in health care research at Lehigh. To move the initiative forward, several important steps need to happen in fall 2008. These are outlined in this section.

Lehigh Community Input on the Health Care Initiative Theme

Two broad themes (“Health Over the Life Course” and “Global Health and the Environment”) are proposed as opportunities that can be used to focus the enhancement of health care-related research in a niche suited to Lehigh University. While survey responses and e-mail communications from well over 100 faculty members were considered in developing these themes, feedback from those faculty members and programs most interested is critical for the administration as they evaluate the themes. Each theme has several possible focal areas for research enhancement and a proposed signature piece. Several mechanisms to obtain feedback from the Lehigh community are proposed:

- Town meeting(s) to provide a chance for questions and discussion
- Electronic posting of the white paper with electronic feedback
- Visits by members of the Health Care Initiative task force to colleges and requesting departments
- Appeal to the survey respondents to comment on the white paper regarding their perspectives and interest

Health Care Initiative Leadership Transition

The task force members who produced this white paper propose that a transition team composed of some members of the task force and other volunteers help to manage the activities proposed for fall 2008 and that the administration name an implementation team to start in 2009 so that the effort can continue in a timely fashion.

Resource Investigations

Members of the transition team should work with ORSP and Development staff to obtain a clear idea of funding issues regarding the research areas proposed in the themes and general resource issues related to the initiative as a whole. We present a brief analysis for each theme in the document, but we believe funding opportunities for program development need to be explored and a more detailed analysis of grant opportunities should also be made.

Examination of Institutes, Centers, and Programs at Other Institutions

Members of the transition team (and others?) should investigate institutes, centers, and research initiatives at other institutions, including some listed in the document and others that come to our attention.

Community Health Care Relationship Progress

Several activities have contributed to the development of a community health care/Lehigh University partnership to assess health care needs/issues in the local community. The development of this partnership should continue in parallel with the planning and development of the Health Care Initiative.

Focus Group Conferences/Seminars

Several events designed to bring Lehigh faculty from different disciplines with shared health care research interests together, such as afternoon seminars, should be held. The goals of these seminars would be to increase faculty understanding of Lehigh research in these areas and the possible development of collaborations that could enhance research. Details of the seminar format would depend on the number and interests of faculty who would attend on a specific topic. Examples of possible seminar topics would be obesity (and diabetes?), aging and health issues, and health care data mining at Lehigh, to name a few.

Conclusions

For an institution of this size, Lehigh has a large number of faculty members with scholarly interests in health and health care. Currently, expertise in these areas is broad rather than deep. Besides the advantages for breadth of instruction, this breadth of expertise provides an exciting opportunity for Lehigh to support one or two major themes identified in this report: Health Over the Life Course and/or Global Health and the Environment as the main foci for the Health Care Initiative at Lehigh. Both themes have significant advantages and would position Lehigh to fill an important niche in health care research. Both themes also have the advantages of allowing development that can also contribute significantly to enhancement of academic programs currently in place and additional programs planned for the near future. Each theme has specific resource implications and positions Lehigh in a different place with regard to the community and other initiatives currently underway. Members of the task force look forward to a campus-wide discussion of the Health Care Initiative proposal and the opportunity to move forward with this very critical initiative.

Appendix: Health Care Interest Survey

1. Do you have any ongoing or planned scholarship in the broad area of health care?
2. Do you teach any courses that have a significant component related broadly to one or more aspects of health care? If yes, please provide the name of the course(s) and whether it is offered regularly or not.
3. Do you currently have or hope to develop collaborations with health care providers? If yes, please describe the nature of your collaborations and the partners with whom you are working.
4. Do you currently supervise students in, or help students to obtain, health care-related field placements in the community or beyond? If yes, what kinds of programs are these and for what programs at Lehigh?
5. Do you currently have any external funding for health-related research projects? If yes, please specify.
6. Are you interested in participating in/contributing to the Lehigh Health Care Initiative in any way? If yes, please elaborate.

Survey respondents and individual contacts

Linda Bambara, education and human services
Filbert Bartoli, electrical and computer engineering
Barry Bean, biological sciences
MJ Bishop, education and human services
Chad Briggs, international relations
Derick Brown, civil and environmental engineering
R. Michael Burger, biological sciences
Lynne Cassimeris, biological sciences
Liang Cheng, computer science and engineering
Xuanhong Cheng, materials science and engineering
Meng-Sang Chew, mechanical engineering and mechanics
Ravindra Chitturi, marketing
Shin-Yi Chou, economics
Mooi Choo Chuah, computer science and engineering
Constance Cook, modern language and literature
David Cundall, biological sciences
Stephen Cutcliffe, science, technology, and society
Mary Deily, economics
Robin Dillon, philosophy

Beth Dolan, English
Judith Duffield-Smith, education and human services
George DuPaul, education and human services
Robert Flowers, chemistry
Sharon Friedman, journalism and communication
Keith Gardiner, industrial and systems engineering
Samir Ghadiali, mechanical engineering and mechanics
James Gilchrist, chemical engineering
James Gunton, physics
Ned Heindel, chemistry
Karen Hicks, sociology and anthropology
Breena Holland, political science
Wei-Min Huang, mathematics
Xiaolei Huang, computer science and engineering
Diane Hyland, psychology
Mary Kathryn Iovine, biological sciences
Anand Jagota, chemical engineering
Himanshu Jain, materials science and engineering
Sabrina Jedlicka, materials science and engineering
Kristen Jellison, civil and environmental engineering
Lee Kern, education and human services
Arthur King, economics
Bruce Koel, chemistry/interim vice provost for research
Mayuresh Kothare, chemical engineering
Barry Kroll, English
Michael Kuchka, biological sciences
Judy Lasker, sociology and anthropology
Ian Laurenzi, chemical engineering
Lin Lin, Management
Timothy Lomauro, psychology (adjunct)
Dan Lopresti, computer science and engineering
Linda Lowe-Krentz, biological sciences
Jack Lule, journalism and communication
Stefan Maas, biological sciences
Joan Ramage MacDonald, earth and environmental sciences
Patricia Manz, education and human services
James McIntosh, sociology and anthropology
Jeffrey Milet, theatre
Seth Moglen, English
Bruce Moon, international relations
Sudhakar Neti, mechanical engineering and mechanics
Ageliki Nicolopoulou, psychology
Raymond Niedbala, chemistry
John Nyby, biological sciences

Laura Olson, political science
Padraig O'Seaghdha, psychology
H. Daniel Ou-Yang, physics
James Roberts, chemistry
Colin Saldanha, biological sciences
Jeffrey Sands, biological sciences
John Savage, history
Jill Schneider, biological sciences
Keith Schray, chemistry
Ed Shapiro, education and human services
Laurence Silberstein, Jewish studies
Neal Simon, biological sciences
Lawrence Snyder, industrial and systems engineering
Stephen Snyder, economics
Arnie Spokane, education and human services
Lloyd Steffen, ethics/university chaplain
Robert Storer, industrial and systems engineering
Jennifer Swann, biological sciences
Nelson Tansu, electrical and computer engineering
Barbara Traister, English
Dimitrios Vavylonis, physics
Dimitri Vezenov, chemistry
Richard Vinci, materials science and engineering
Arkady Voloshin, mechanical engineering and mechanics
Todd Watkins, economics
Vassie Ware, biological sciences