THE ROLE OF SOCIAL AND BEHAVIORAL SCIENCES IN PUBLIC HEALTH

HEARING

BEFORE THE

SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION

COMMITTEE ON SCIENCE AND TECHNOLOGY

HOUSE OF REPRESENTATIVES

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September 18, 2008

THE ROLE OF SOCIAL AND BEHAVIORAL SCIENCES IN PUBLIC HEALTH

THURSDAY, SEPTEMBER 18, 2008

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:02 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Brian Baird [Chairman of the Subcommittee] presiding.

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CHAIRMAN

RALPH M. HALL, TEXAS
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The Role of Social and Behavioral Sciences in Public Health

Thursday, September 18, 2008
10:00am – 12:00pm
2318 Rayburn House Office Building

Witness List

Dr. Lisa Feldman Barrett
Professor of Psychology, Director of the Interdisciplinary Affective Science Laboratory, Boston College

Dr. John B. Jemmott, III
Professor of Communication, Annenberg School of Communication, Director of the Center for Health Behavior and Communication Research, Department of Psychiatry, School of Medicine, University of Pennsylvania

Dr. Donald S. Kenkel
Professor of Policy Analysis and Management, College of Human Ecology, Cornell University

Dr. Harold G. Koenig
Professor of Psychiatry and Behavioral Sciences, Associate Professor of Medicine, Director of the Center for Theology, Spirituality and Health Duke University

HEARING CHARTER

SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

The Role of Social and Behavioral Sciences in Public Health

THURSDAY, SEPTEMBER 18, 2008
10:00 A.M.–12:00 P.M.
2318 RAYBURN HOUSE OFFICE BUILDING

1. Purpose

The purpose of the hearing is examine the role of the social, behavioral and economic sciences in improving our nation's health and well being and reducing the economic burden of health care.

2. Witnesses:

- **Dr. Lisa Feldman Barrett** is a Professor of Psychology and Director of the Interdisciplinary Affective Science Laboratory at Boston College, with appointments at Harvard Medical School and Massachusetts General Hospital.
- **Dr. John B. Jemmott III** is the Kenneth B. Clark Professor of Communication at Annenberg School of Communication, and a Professor of Communication in Psychiatry and Director of the Center for Health Behavior and Communication Research in the Department of Psychiatry, School of Medicine at the University of Pennsylvania.
- **Dr. Donald S. Kenkel** is a Professor of Policy Analysis and Management in the College of Human Ecology at Cornell University.
- **Dr. Harold Koenig** is a Professor of Psychiatry and Behavioral Sciences, Associate Professor of Medicine, and Director of the Center for Theology, Spirituality and Health at Duke University.

3. Overarching Questions:

- How can the behavioral, social and economic sciences contribute to the design and evaluation of more effective public health policies? What lessons can be learned from the decades-old national campaign to reduce smoking? To what extent are public health policies in general being shaped by what has been learned from the social, behavioral and economic sciences?
- What new and continuing areas of basic research in the social, behavioral and economic sciences could significantly improve our ability to design effective policies? What new technologies and methodologies are enabling advances in the research? Are there promising research opportunities that are not being adequately addressed?
- What is the nature of interactions and collaborations between behavioral and social scientists, biomedical scientists and health (including mental health) practitioners? How might these disparate research and practitioner communities be better integrated to improve human health and well being? Is the Federal Government playing an effective role in fostering such collaboration?

4. Federal Spending on Social, Behavioral and Economic Sciences

Basic and applied research in the social, behavioral and economic sciences is funded out of a number of federal agencies, led by the National Institutes of Health (NIH) and the National Science Foundation (NSF). According to research funding

statistics compiled by NSF,[1] a total of $1.215 billion was obligated to basic and applied research in all social sciences for fiscal year 2006 (FY06), including economics. Psychology was counted separately, and was funded at a total of $1.91 billion in FY06, of which $1.76 billion was funded by Health and Human Services (primarily NIH). Federal support for academic research in particular was $711 million for social sciences and $629 million for psychology. There is also a significant amount of foundation support for public health related research.

The main support for basic research in the (non-medical) social and behavioral sciences comes from the Social, Behavioral and Economics Directorate (SBE) at NSF. Overall, NSF accounts for approximately 60 percent of federal support for basic research in anthropology, social psychology and the social sciences at U.S. colleges and universities. In some fields, including archaeology, political science, linguistics, and non-medical aspects of anthropology, psychology, and sociology, NSF is the predominant or exclusive source of federal basic research support. The SBE budget for FY08 is approximately $220 million, making it the second smallest research directorate at NSF. Fifteen percent of SBE's budget is used not for basic research but to fund the collection and analysis of data on science and engineering research, education and workforce trends (including the data presented here), resulting in the biannual "S&E Indicators."

NIH funds both very basic research, such as that of Dr. Barrett, and research-based interventions such as those designed by Dr. Jemmott. NIH also supports most health economics research, such as that carried out by Dr. Kenkel. NIH's Office of Behavioral and Social Sciences Research (OBSSR), created by Congress in 1993, serves as a coordinating and policy development office for research across NIH's many institutes, rather than funding research directly. OBSSR also serves as NIH's focal point for coordination of social and behavioral research agendas with other agencies, including NSF. Staff at both NSF and NIH report having a close and productive working relationship. Occasionally the agencies issue joint solicitations, such as a current solicitation in computational neuroscience.

5. Public Health Applications of Social and Behavioral Sciences

NSF does not explicitly fund health research, but it does fund basic research on human behavior as it relates to biological and social phenomena. For example, NSF funds medical anthropologists who study the distribution of genes in a particular region as it relates to the prevalence of a certain disease, and cognitive neuroscientists who study aspects of brain function relevant to autism. NIH funds social and behavioral research with direct public health applications, such as reducing tobacco use, improving mental health, preventing obesity and slowing the HIV/AIDS epidemic.

One of the biggest public health stories of the 20th century is the reduction in tobacco use and smoking-related diseases. Behavioral and social science research helped shape policies to stop kids from taking up smoking, and interventions to help those already addicted to quit. According to the Centers for Disease Control and Prevention, the portion of Americans who smoke dropped from 42.4 percent in 1965 to 20.8 percent in 2007. However, cigarette smoking remains the leading preventable cause of death in the United States, accounting for approximately one of every five deaths (438,000 people) each year.[2] The economic costs associated with smoking-related illnesses are estimated to be $165 billion in health care and disability.

As biomedical and clinical researchers continue to develop understanding of disease mechanisms and develop effective pharmaceutical therapies, social and behavioral scientists continue to elucidate the role of social and behavioral factors in health and illness. The research community, however, has moved beyond genes or environment arguments about physical and mental health to studying how genes and environment interact in complex ways to produce behavioral and health outcomes. As such, there is an increasing need for these disparate research and practitioner communities to break down disciplinary and cultural barriers to advance public health and well being.

6. Questions for Witnesses

Two of the witnesses in this hearing carry out the basic behavioral and economics research. One of the witnesses uses theories based on research to design interven-

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[1] Data are based on self-reporting by agencies. In many cases, especially where there is interdisciplinary work, it is hard to tally exact dollars spent on one field or another, so these values are at best an estimate.

[2] *http://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/adult_cig_smoking.htm*

tions to stem the spread of HIV/AIDS among urban youth. A fourth witness studies the relationship between spirituality and health. All of the witnesses were asked to testify about the nature of their own research and its significance to public health policy. They were also asked about the increasing role of collaborations between behavioral scientists, biomedical scientists and public health practitioners to advance public health, and the role of the Federal Government in fostering such collaborations.

Chairman BAIRD. Good morning. Thank you all being here for another of this committee's series of hearings on the role of social sciences and helping to meet some of the grand challenges facing our country today. This is the third in a series. We have previously had an operable hearing on social sciences as they impact energy policy and practices, then we had one on defense issues and its applications there.

Today we look at one of the other great challenges facing our country, and that is health care. Our nation faces a triple challenge of access, cost, and outcome. We have 45 to 47 million Americans with no health insurance. We spend more per capita than any other country on Earth on health care and yet our outcomes are not what they ought to be, and a great number of illnesses are fairly preventable, and a vast amount of our spending nationwide is related to behaviorally-influenced illnesses, either the behavior directly caused the illness or they can exacerbate the impact or behavioral factors can impede the treatment process. And this includes everything on the causal part, it includes everything from smoking to some degree of obesity.

On the treatment side behavioral interventions have been immensely helpful in helping us address things like adherence to chemotherapy regimes or in the case of, for example, tuberculosis, drug adherence, medication adherence. These are absolutely critical.

And so we believe as a former social scientist myself, that if we want to solve some of these health care problems, the social scientists have an absolutely essential role to play in that, and we have witnesses today who will share a diverse perspective on that.

In a moment I am going to acknowledge my dear friend and colleague, Dr. Vern Ehlers, for opening remarks. We also have Dr. Roscoe Bartlett with us here today, and Eddie Bernice Johnson is here as well.

Before we do, though, I want to acknowledge a Member of the Science Committee staff. Jim Wilson is retiring at the end of this year. I think this will be our last hearing before this committee, so hence, perhaps, Jim's last hearing. He is probably wiping away tears as I speak. Jim has been on the professional staff of the Committee since 1987. He invented the Internet, the Blackberry, and a host of other modern devices.

Jim received his BS, MS, and Ph.D. degrees in aerospace engineering from West Virginia University, completed the Senior Manager's in Government Program at Harvard's Kennedy School of Government. He previously managed research programs in fluid dynamics at the Air Force Office of Scientific Research in Washington, DC, and served as an officer in the U.S. Air Force at the Flight Dynamics Laboratory at Wright Patterson Air Force Base in Ohio. Then he decided to do something with his life and came to work for us here at the staff.

He has done an outstanding job. He is a good friend and has been a great public servant, and I just want to express my personal appreciation, and Jim, we have a small token of that. This is a flag which we took to Antarctica, and this has actually been to the South Pole and around the South Pole, so it has been in every time

zone. That is an easy trip. You just walk around. But, Jim, please accept this with our gratitude for many years of service.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

Good morning and welcome to this Research and Science Education Subcommittee hearing on the role that social, behavioral and economic sciences play in improving our nation's health and well being and reducing the economic burden of health care. This happens to be the very last scheduled hearing before the Science and Technology Committee this year. It seems fitting, as we are in the midst of a heated campaign season in which skyrocketing health care costs are a hot topic, that we highlight an aspect of health care that gets too little attention from the research and medical communities and government alike: prevention.

We have a health care system that discourages doctors from spending time on preventative care. I don't think this committee is going to solve that problem. But we will look today at the choices that individuals make, and what researchers know about how and why we make those choices and how public policy might be shaped to help influence those choices to the benefit of both ourselves and society.

Each of us decides whether to smoke, to exercise, to cook at home or stop at the nearest fast food joint. Most if not all of us in this room are pretty lucky. We are blessed with a good education, good health insurance and a well-paying job. We have all of the tools and resources we need to make the healthy choice every time, but we still engage in unhealthy behaviors. Access to information and resources is not the sum of what influences our decisions.

Take smoking. After decades of an aggressive public anti-smoking campaign, the overall rate of smoking in the U.S. decreased by one-half to 21 percent. I imagine there are few teenagers in the U.S. who haven't had it drilled into them that smoking can kill. Yet, according to the CDC, each day approximately 4,000 kids between the ages of 12 and 17 years initiate cigarette smoking. Social, behavioral and economics research did and continues to shape effective anti-smoking policies and to provide insight into why some efforts have fallen short. This is first and foremost about the health and well being of individual Americans. But it is also about the cost to our society. Smoking alone can be blamed for approximately $165 billion per year in health care and disability costs.

Of course our health is not governed entirely by our behavior. Even those of us with the healthiest habits can be struck by a physical or mental illness that requires treatment. How do we respond to such challenges? Do we have the tools, and do our doctors have the tools to help us combat depression for example, whether it comes on out of the blue or in response to a major illness or trauma? They say a healthy body makes a healthy mind. The inverse is equally true. Yet it is only in the last decade or two that researchers are seriously exploring the mind-body connection. Another important and recent advance is that increasingly, clinicians, biologists and behavioral scientists are joining forces to answer the question: how do genes and environment interact, rather than making it an either/or proposition.

The panel before us is engaged in some exciting work, ranging from very basic research on emotions to design of theory-based interventions to stop the spread of HIV/AIDS. I thank all of the witnesses for being here this morning and I look forward to your testimony.

Chairman BAIRD. Vern, I recognize my dear friend, Dr. Ehlers.

Mr. EHLERS. Thank you for yielding. I would just like to add my accolades. I have worked with Jim for a number of years. He has always been imminently fair, very thorough, and very capable. And we are certainly going to miss him. The only puzzle I have had constantly after all my great intelligent conversations with him is how he ended up being a Democrat. But that may be a partisan point of view. But, Jim, we really appreciate your work, and we are all going to miss you. Thank you.

Chairman BAIRD. When you look at Jim's resume, those of us who are Members of Congress may not be rocket scientists, but some of our staff are. And that is very nice.

Thank you for your remarks, Dr. Ehlers.

With that I am pleased to recognize Dr. Ehlers for an opening statement.

Mr. EHLERS. Thank you, Mr. Chairman. Today's hearing will delve into the public health implications of social science research and its application. Preventing disease and premature death is the underlying goal of the marriage between public health and the social sciences, and the impacts of this research are substantial.

And I must confess, Mr. Chairman, I recognize we have had all these hearings because you are a social scientist, but you have done us a service because all the different hearings we have had this year have certainly opened my eyes to the power and usefulness and the social sciences in many different areas. So I thank you for holding all these hearings.

The Social Behavior and Economics Directorate at the National Science Foundation provides support for the fundamental research that underpins many of today's public health interventions. In addition to studying the science of the brain NSF works to integrate the microscopic with the macroscopic actions of our day-to-day lives.

In many ways the social sciences face similar challenges as the physical sciences do in bringing an innovative idea from the laboratory to the marketplace. Humans are such dynamic characters, particularly when it comes through their own health, that the scientists before us must juggle many different variables. Conducting gold-standard research projects with human subjects certainly poses unique challenges. Understanding the root causes of human behavior and emotion will assist lawmakers in crafting effective public health policy.

I appreciate the work of the Chairman and staff on this series of hearings which have educated Members and the public about how social science research is impacting human behavior, energy, national security, and today perhaps the most important topic, how it affects our health. I look forward to hearing from our witnesses today about the research in these areas, and I thank you all for your attention.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

Today's hearing will delve into the public health implications of social science research and its application. Preventing disease and premature death is the underlying goal of the marriage between public health and the social sciences, and the impacts of this research are substantial.

The Social, Behavioral and Economics directorate at the National Science Foundation (NSF) provides support for the fundamental research that underpins many of today's public health interventions. In addition to studying the science of the brain, NSF works to integrate the microscopic with the macroscopic actions of our day-to-day lives. In many ways, the social sciences face similar challenges as the physical sciences do in bringing an innovative idea from the laboratory to the marketplace. Humans are such dynamic characters, particularly when it comes to their own health, that the scientists before us must juggle many different variables. Conducting "gold standard" research projects with human subjects certainly poses unique challenges. Understanding the root causes of human behavior and emotion will assist lawmakers in crafting effective public health policy.

I appreciate the work of the Chairman and his staff on this series of hearings in the 110th Congress, which have educated Members and the public about how social science research is impacting human behavior as it relates to energy, national security, and, today, our health.

I look forward to hearing from our witnesses today about their research in the social sciences. Thank you for your attendance.

Chairman BAIRD. Thank you, Dr. Ehlers. If there are other Members who wish to submit additional opening statements, your statements will be added to the record at this point, and at this time I would like to introduce our distinguished witnesses.

Dr. Lisa Feldman Barrett is a Professor of Psychology and Director of the Interdisciplinary Affective Science Laboratory at Boston College with Appointments at Harvard Medical School and Massachusetts General Hospital. Dr. John B. Jemmott, III, is Kenneth B. Clark Professor of Communication at the Annenberg School of Communication and a Professor of Communication in Psychiatry and Director of the Center for Health Behavior and Communication Research, and the Department of Psychiatry at the School of Medicine at the University of Pennsylvania.

Dr. Donald S. Kenkel is Professor of Policy Analysis and Management in the College of Human Ecology at Cornell University, and Dr. Harold G. Koenig is a Professor of Psychiatry and Behavioral Sciences and Associate Professor of Medicine and Director of the Center for Theology, Spirituality, and Health at Duke University.

As our witnesses know, we spoke briefly before, their spoken testimony is limited to five minutes each for your initial comments, and after that Members of the Committee will have five minutes each to ask questions. We are grateful for your years of research and contribution and that you would take the time from certainly busy schedules to join us today.

With that we will, we have been joined, I should mention by Dr. Lipinski and thank you. And we will start with Dr. Barrett, please.

STATEMENT OF DR. LISA FELDMAN BARRETT, PROFESSOR OF PSYCHOLOGY; DIRECTOR OF THE INTERDISCIPLINARY AFFECTIVE SCIENCE LABORATORY, BOSTON COLLEGE; APPOINTMENTS AT HARVARD MEDICAL SCHOOL AND MASSACHUSETTS GENERAL HOSPITAL

Dr. BARRETT. Congressman Baird, you and your colleagues deserve our deepest thanks for encouraging NIH to support basic research in the social and behavioral sciences. My colleagues and I are very grateful for your efforts, and I very much appreciate the opportunity to speak with you today.

Seven years ago when the Twin Towers collapsed, people had many reactions. I would like to read two to you. One person said, "My first reaction was terrible sadness but then came anger, because I couldn't do anything with the sadness." A second person said, "I felt a bunch of things I couldn't put my finger on, maybe anger, confusion, fear. I just felt bad."

These examples demonstrate a phenomenon that I discovered almost 20 years ago. Some people feel the heat of anger, they feel the despair of sadness, they feel the dread of fear. Other people use the same words, but they feel, for lack of a better word, bad. Same words, different feelings.

Over a 10-year period my lab found that people like the first speaker who have emotional expertise are more flexible in regulating their emotions. They are more centered, they are less buffeted by the slings and arrows of life than the second speaker.

These basic research findings have now been translated into emotional literacy programs for children, teachers, and school administrators. By the end of next year 250 schools in the New York System alone will participate, and the results are already clear. Children who can identify, understand, and label their emotions effectively have fewer clinical symptoms, they are at lower risks for violent behavior, and for drug and alcohol abuse. They have better social skills, they have stronger leadership skills, and perhaps most surprisingly, they have higher scores, grades, in math, science, reading, and so on, meaning that emotional literacy must be a central piece of educational reforms like No Child Left Behind.

These are welcome outcomes, especially given the recent UNICEF report showing that U.S. children have the second lowest well-being scores across 21 developed nations.

Now, emotional literacy isn't just about happiness. Emotionally-intelligent children turn into the skilled and productive workforce of tomorrow, which translates into an increase in the gross domestic product. And emotional literacy has the potential to play a role in addressing some of the Nation's most pressing problems. For example, anecdotal evidence shows that regardless of people's plans, they often decide to retire on the spur of the moment after, let us say, a particularly bad day at the office.

So instead of retiring at age 67, when they should, or at age 65, when they planned to, they retire on average at age 63. By teaching people emotional literacy when they are adults, we may be able to prevent that bad day at the office from causing them to retire early, allowing people more financial security and saving the government substantially in Social Security and health care benefits.

From a purely scientific standpoint the discovery that not everybody feels anger or sadness or fear has ignited a literal paradigm shift in the study of emotion. We now know that emotions are not simple reflexes that are flipped on like a light switch in certain parts of the brain, which is why there is no single pill that cures depression, and there is no single gene that controls happiness.

The exact nature of emotion is now the topic of heated debate and furious research, and the history of science teaches us that key scientific discoveries are made during such times. At the frontiers of science nothing speeds scientific progress like the clash of competing viewpoints. This may not be comfortable, and it is certainly not cheap, but it is absolutely necessary.

Science is like a food chain, with basic research at the base, feeding translational research, which feeds applied research, and so on. Without this healthy base the entire ecosystem becomes weak and can't survive. Basic research in the social and behavioral sciences, you know, surprisingly, it may sound surprising to say this, is really being starved in America, and without the basic research today there will be no critical health solutions for tomorrow.

It takes time for basic science to feed solutions, often decades. Scientific discovery is like slowly peeling an onion, while exploring one question, other, more nuanced questions, are revealed beneath. This means that you can't run science like you run on a business model where you set a tangible goal and try to meet it on a strict timeline of five years.

Because the neuroscientist who discovered that canary brains grow new cells after birth wasn't trying to solve the puzzle of human mental illness. Social scientists who studied the evils of conformity after World War II weren't trying to keep people from using drugs and alcohol, and my own research on emotion wasn't originally targeted at helping children read better or helping retirees decide, you know, when is the financially right time to decide.

Regardless of the goals that motivated my basic research or any basic research in the first place, it is simply a fact that this research is necessary to achieve the critical, and often surprising, results that help people live healthier and more productive lives.

[The prepared statement of Dr. Feldman Barrett follows:]

PREPARED STATEMENT OF LISA FELDMAN BARRETT

Abstract

People differ markedly in their emotional expertise. Many people, but not all, feel the heat of anger, the despair of sadness, the dread of fear. Some instead experience amorphous feelings that are either pleasant or unpleasant. This basic research finding has been translated into emotional literacy training programs with proven health, economic, and educational benefits. It also illustrates how basic research in the social and behavioral sciences allows people to live healthier and more productive lives.

Thank you for the opportunity to speak with you today. I run an interdisciplinary lab where we study the very basic nature of emotion, from both the standpoint of the psychologist (who measures behavior) and the neuroscientist (who measures the brain). Today, I'll wear my psychologist's hat and tell you the story of a single scientific discovery that is already improving the lives of Americans. It is also a promising lead to solving some of the country's most pressing public health issues, and illustrates the value of basic research in making a healthier and more productive nation.

Seven years ago, when the twin towers collapsed, people had many reactions. Here are just two. One person said "The first reaction was terrible sadness and tears . . .. But the second reaction is anger, because you can't do anything with the sadness." Another said "I felt a bunch of things I couldn't put my finger on. Maybe anger, confusion, fear. I just felt bad on September 11th. Really bad." These examples demonstrate a phenomenon about emotion that I discovered fifteen years ago.

When I was in graduate school, I noticed something curious in my psychotherapy patients. Some people used emotion words to refer to very precise and distinct experiences—they felt the heat of anger, the despair of sadness, the dread of fear. Others used the words "anger," "sadness," and "fear" interchangeably, as if they did not experience these states as different from one another. They felt, for lack of a better word, "bad." Outside the therapy room, I saw the same thing in friends and family and students. This observation was the basis for a decade-long research project (supported by both NSF and NIH) where my lab tracked the emotional experience of over 700 people during the course of everyday life using a then-novel scientific procedure called computerized experience-sampling (*www.experience-sampling.org*). Using novel software and statistical procedures, we made an important discovery: people differ in their emotional expertise. Some people, as in the first example, are emotion experts and experience a wide variety of nuanced emotions, in much the same way that a wine expert can distinguish the type of wine as well as its vineyard and vintage. Other people, like the second example, experience emotion as an amorphous feeling that is either pleasant or unpleasant, just like wine novices who can't tell much more than whether a wine is red or white. Over a ten-year period, my lab discovered that differences in emotional expertise translate to important outcomes. Emotion connoisseurs are more flexible in regulating their emotions. They are more centered, and less buffeted by slings and arrows of life. Those with less emotional expertise, by contrast, live life as turbulent roller coaster with more ups and downs.

These basic research findings are now being translated into emotional literacy training programs for children (ages four to fourteen), teachers, and school administrators (see *www.ei-schools.org*). By the end of next year, 250 schools in the New York school system alone will participate, and already the results are promising. Children who can identify, understand, label, and regulate their emotions effectively

have fewer clinical symptoms, and are at lower risk for violent behavior and drug and alcohol abuse. They have better social skills, and stronger leadership skills. Perhaps most surprisingly, hundreds of studies show that emotionally intelligent children have higher grades in math, science, and reading, meaning that emotional literacy must be included in educational reforms like No Child Left Behind. These are welcome outcomes, especially given the recent UNICEF report showing that U.S. children have the second-lowest rate of well-being across 21 developed nations.

But emotional expertise isn't just about happiness—it translates into economic stability and productivity for our country. The emotionally intelligent children of today become the skilled and productive adults of tomorrow. In a recent forum on children's education, the noted economist and Nobel Laureate James Heckman argued that social and emotional expertise is necessary to improve the quality of the American workforce. A happier and socially skilled workforce translates into an increase in the Gross Domestic Product.

Emotional expertise will even play a role in addressing some of the Nation's most pressing problems. For example, emotional literacy may help to prevent early retirement in adults, which costs the government significantly in social security and health care benefits. Anecdotal evidence shows that, regardless of their plans, people often decide to retire on the spur of the moment, say, after a particularly bad day in the office. So instead of retiring at age 67 (when they should), or age 65 (when they plan to), they retire, on average, at age 63. By teaching emotional literacy to adults, we can prevent that bad day from causing them to retire early, allowing people more financial security and saving the government a lot of money in the process.

From a purely scientific standpoint, the discovery that not everyone feels anger or sadness or fear has helped to ignite a paradigm shift in the study of emotion. Emotions used to be thought of as simple reflexes or light switches that turn on parts of your brain, and that could be turned off by a drug or changing the right gene. But we now know that's not the case, which is why there's no pill that cures depression, and no single gene that controls happiness. The exact nature of emotion is now the topic of heated debate and furious research, and the history of science teaches us that key scientific discoveries are made during such times. At the frontiers of science, nothing speeds scientific progress like the clash of competing viewpoints. This may not be comfortable, or cheap, but it is absolutely necessary.

Science is like a food chain, with basic research at the base, feeding translational research, which feeds applied research, which can be used by service providers. Without a healthy base, however, the entire ecosystem becomes weak and cannot survive. Basic research in social and behavioral sciences is being starved in America. And without this basic research today, there will be no critical health solutions for tomorrow.

It takes time for basic science to feed applied solutions. In genetics or pharmacology, the life cycle is of discovery is usually several decades. Scientific discovery is like slowly peeling an onion—while exploring one question, other, more nuanced questions are revealed beneath (and sometimes, a lot of tears are shed along the way). But here in the social and behavioral sciences, a basic finding about emotion was translated after only 15 years—a relatively quick outcome for science, but one that serves both public health and the public treasury.

Science is about exploration, risk, and discovery. This means that you cannot run scientific discovery like a business, where you set a tangible goal and try to meet it on a strict timeline. A seemingly trivial, everyday occurrence or a very abstract idea can, upon closer inspection, open up a new scientific vista. The neuroscientist who discovered that canary brains grow new cells after birth wasn't *trying* to solve the puzzle of human mental illness. The physicists who discovered quantum mechanics were not *trying* to build a better computer. Social scientists who studied the evils of conformity after World War II weren't *trying* to keep people from using drugs. And my own research on emotion wasn't *originally* targeted at helping children and retirees, but in the end, this is where it has led. Regardless of the goals that motivate basic research in the first place, it is simply a fact such research is necessary to achieve the critical, and often surprising, results that help people live healthier and more productive lives.

Congressman Baird, you and your colleague Congressman Kennedy deserve a lot of credit for encouraging NIH to provide a better infrastructure to support basic research in the social and behavioral sciences. I know I speak for my colleagues when I say that we are all very grateful for your efforts. I myself am fortunate that my laboratory is well supported by federal funding agencies at the moment. In the context of today's hearing, however, this funding success is a bit misleading, because the majority of it pays for the neuro-imaging side of my research on emotion. Like many labs around the country, my lab is also struggling to move our social and be-

havioral research forward. For the social and behavioral sciences to realize their full potential in the service of this country's health and well-being, labs like my own need four things to succeed: a well-trained scientific workforce of sufficient expertise and diversity, more advanced technology that is suited to the scientific questions we want to ask (whether or not they have an applied value that is immediately obvious), an adequate level of research funds to see our best ideas (and perhaps riskiest) forward, and open minds that are not mired in the habits or agendas of the past.

BIOGRAPHY FOR LISA FELDMAN BARRETT

Lisa Feldman Barrett, Ph.D., is currently Professor of Psychology and Director of the Interdisciplinary Affective Science Laboratory at Boston College, with appointments at Harvard Medical School and Massachusetts General Hospital. Dr. Barrett received her Ph.D. in clinical psychology in 1992, and has since received additional training in social and personality psychology, psychophysiology, cognitive science, neuroanatomy, and cognitive neuroscience. Her research focuses on very basic question of what emotions are, both from both the standpoint of the psychologist (who measures behavior) and the neuroscientist (who measures the brain). Her work also incorporates insights from philosophy, anthropology, and linguistics.

Dr. Barrett is an elected Fellow of the Association for Psychological Science, the American Psychological Association, and the Society for Personality and Social Psychology. In 2007, she received an NIH Director's Pioneer Award for innovative research on emotion. She is also the recipient of an Independent Scientist Research Award from the National Institute of Mental Health, a Career Trajectory Award in Experimental Social Psychology, the James McKeen Cattell Award, and an American Philosophical Society Fellowship. Dr. Barrett has served as an elected member to the governing boards of the International Society of Research on Emotion and the Society for Experimental Social Psychology. For the past eight years, she has continually served on grant review panels for either the National Science Foundation or the National Institutes of Health. She is a founding Editor-in-Chief of the journal *Emotion Review,* and sits on the editorial boards of top tier journals in both psychology and neuroscience.

Dr. Barrett's lab has been continually funded by the National Science Foundation since 1998. In addition to NSF funding, her lab currently receives support from the NIH Director's Pioneer Award program in the National Institute of General Medicine, the National Institute on Aging, and the Army Research Institute.

Dr. Barrett has published over 90 papers and chapters, including a National Research Council white paper on the nature of emotion. She has edited three books on the science of emotion, including the current edition of the *Handbook of Emotion.* She also wrote the current entry on emotion for World Book Encyclopedia.

Chairman BAIRD. Thank you, Dr. Barrett.

Dr. Jemmott.

STATEMENT OF DR. JOHN B. JEMMOTT III, KENNETH B. CLARK PROFESSOR OF COMMUNICATION; PROFESSOR OF COMMUNICATION IN PSYCHIATRY; DIRECTOR, CENTER FOR HEALTH BEHAVIOR AND COMMUNICATION RESEARCH, UNIVERSITY OF PENNSYLVANIA, SCHOOL OF MEDICINE AND ANNENBERG SCHOOL FOR COMMUNICATION

Dr. JEMMOTT. I am very happy to be here today to share some of the work that I have been doing over the past 20 years or so in the era of HIV prevention, conducting a program of research that is designed to identify the social psychological factors that underlie HIV risk-associated behavior. Once you identify those factors, we develop interventions that are based on theory and that are tailored to the population to try to change their behavior. We then evaluate those intervention strategies using rigorous scientific methods, usually a randomized control trial, which is the best way to find out whether an intervention is effective.

Along the way we try to address some practical questions about the best way to do HIV prevention. This might be questions about the race of the facilitator or the gender of the facilitator or the gen-

der, composition of the group, or the age of the facilitator, all of these practical question about how to do intervention.

Then if we find that an intervention is effective, we then try to disseminate it to people who can actually use to, go beyond publishing it in journals and get it to the end users. Then when the end users are using it, it leads to additional questions about whether it still works, and so we look at that as well.

In our research we found that two of the key characteristics of effective interventions is one, that they are grounded in some behavior change theory, some systematic understanding of human behavior. And second, that they are tailored to the population, and this is usually based on qualitative research with that population so you can understand their beliefs and the context in which the behavior occurs.

This slide shows one of the theories that we use called the theory of planned behavior. So it is a model of behavior. So the behavior might be abstinence or it could be condom use, and we basically begin at the behavior, and we work backwards in the model. We identify an intention, which is a plan to engage in the behavior. The best predictor of a person's behavior is a plan to do that behavior. And then we look at different types of beliefs that could influence those behaviors.

And those beliefs did not come from the pages of academic journals. They come from our target population through qualitative research. We ask them what they believe. Then once we have their beliefs, we then try to develop interventions to target the beliefs, to change the beliefs in ways that are supportive of behavior.

So through a mediational change by affecting building the intervention, affecting the beliefs, affects intentions and changes behavior, and you can extend the model further to a health outcome such as sexually-transmitted disease. So that is basically how our research is done.

Our measures of success are the outcomes in terms of sexual behaviors related to HIV infection; abstinence, condom use, and limiting the numbers of partners. In some of our studies we are also, where appropriate, able to collect biological specimens that we can test for sexually-transmitted diseases such as chlamydia, gonorrhea, herpes simplex. And because we want to understand why the intervention works or why it didn't work, we also look at mediator variables, the beliefs and intentions that I mentioned earlier. Because if the intervention worked, we want to know which beliefs were actually responsible for the good outcome that we saw.

But on the other hand, if it didn't work, then we want to know did we, in fact, change the beliefs that we intended to change and also if we did change them, were they actually related to the behavior. And then in this way we can design better interventions in the future.

We also look at the participants and the facilitators' evaluations of the intervention because that is important in terms of whether it is practical and can be used in the real world.

We have developed a number of successful interventions, the first five that you see listed there are being disseminated now by the Centers for Disease Control, and we have two others that are effi-

cacious that we hope to have disseminated soon, one of which is in South Africa, where the HIV epidemic is having the largest impact.

In terms of scaling up, there are a number of issues that come into play in terms of whether success interventions are adopted. Sometimes they are not. What are the variables that affect that? Interventions often have to be adapted, which means changing them, and so the question is if you change it, does it still work? So what kinds of adaptations are useful, and which ones are harmful?

And then the third question is if it is efficacious in a randomized-controlled trial, is it still effective when it is used by teachers in schools or health professionals in clinics? And so researchers are required to look at effectiveness as well.

We at the University of Pennsylvania and the Behavioral Sciences Cores, we cover a lot of different populations and research in a variety of different venues that I will not be able to go into, and we collaborate with people in other disciplines within the Center, in immunology, and clinical core in particular, so we see how the different areas of science work together with social science to address these health problems.

And I will stop here.

[The prepared statement of Dr. Jemmott follows:]

PREPARED STATEMENT OF JOHN B. JEMMOTT III

1. Please describe your work to prevent the spread of HIV/AIDS among urban youth and other populations. What social and behavioral theories underlie your research? How do you apply those theories to design and test interventions that may reduce risky behaviors in your target populations? What are your measures of success?

My colleagues and I have been conducting a program of HIV/STD risk-reduction research in urban populations. Our research program has several objectives. First, we seek to identify the social psychological factors that underlie HIV/STD risk behavior. Second, we seek to identify theory-based strategies that are culturally and developmentally appropriate. Third, we evaluate the efficacy of those strategies using scientifically sound methodology. This usually involves the use of a randomized controlled trial in which participants are randomly assigned to receive the intervention or to a control condition. A randomized controlled trial provides the most scientifically valid evidence for the efficacy of an intervention. Fourth, we address practical questions about the best way to implement HIV/STD risk-reduction interventions. For instance, we have examined whether the efficacy of an intervention varies depending on the race of the facilitator, the gender of the facilitator, whether the facilitator is a peer or an adult, and whether the intervention is implemented in single-gender or mixed gender groups. Finally, if an intervention is found to be efficacious, we seek to disseminate it so that it is available to providers who can employ it to curb the spread of HIV among their clients. This also leads additional research questions regarding the adaptation of evidence-based interventions to new settings and populations, factors affecting the adoption of interventions by service providers, and factors affecting the effectiveness of interventions when implemented by service providers and in new settings or populations.

Our research as been funded since 1988 by the National Institute of Mental (NIMH), the National Institute of Child Health and Human Development (NICHD), the National Institute of Nursing Research (NINR), the Centers for Disease Control and Prevention (CDC), and the American Foundation for AIDS Research. We have conduced research with a diversity of populations, including inner-city African American adolescents, African American parents and their adolescent children, African American women clinic attendees, African American and Latino adolescent female clinic attendees, African American HIV serodiscordant couples where one partner has HIV and the other does not, African American men who have sex with men (MSM), middle class White college students, English-speaking and Spanish-speaking Latino adolescents, Xhosa-speaking South African adolescents, and Xhosa-speaking South African men. We have conducted our studies in a variety of settings, includ-

ing schools, churches, universities, adolescent medicine clinics, women's health clinics, community-based organizations, low-income housing developments, and neighborhoods/communities.

To address the problem of HIV/STD in any society requires an array of interventions that can be implemented in a variety of venues by different kinds of facilitators. Accordingly our research has developed many different types of interventions. A contentious debate in the area of HIV education and sex education for adolescents has revolved around the extent to which interventions should emphasize sexual abstinence as opposed to condom use. We have developed safer-sex interventions emphasizing condom use, abstinence-only interventions, and comprehensive interventions stressing both abstinence and condom use. Another issue has been whether peer educators are more effective than adult facilitators in changing adolescents' sexual behavior. We have developed both peer-led and adult-led interventions. Most of our interventions have involved small groups of participants led by a facilitator or a pair of co-facilitators. However, we have also developed one-on-one individual interventions for certain circumstances: for instance, nurses serving women in a hospital clinic or service providers to African American MSM who may conceal their involvement with men and consequently would be unwilling to attend a small group intervention. We have identified several efficacious interventions, including Be Proud! Be Responsible!, Making Proud Choices—a Safer Sex Intervention, Making a Difference—an Abstinence Based Approach, Cuidate, which is a Latino-tailored adaptation of Be Proud! Be Responsible!, Sister to Sister, which is an intervention for African American women in clinical settings, Sisters Saving Sisters, which is an intervention for African American and Latino adolescent girls, and Let Us Protect Our Future, which is an intervention for South African adolescents. Of these interventions, Be Proud! Be Responsible!, Making Proud Choices, Making a Difference, Cuidate, and Sister to Sister have been included in dissemination initiatives of the CDC.

Our experiences in this area teaches that two key characteristics of effective HIV/STD risk-reduction interventions are (a) grounding in behavior change theory and (b) tailoring to the population or culture served. The social and behavior theories that we have employed include the social cognitive theory and the reasoned action approach, which includes the theory of reasoned action and its extension the theory of planned behavior. We use social cognitive theory to suggest intervention strategies to achieve behavior change, including skill building, modeling, reinforcement, and activities to build self-efficacy. We use the reasoned action approach to help identify beliefs that should be targeted by the interventions to achieve behavior change. We selected the reasoned action approach because it can be tailored to a variety of populations and cultures, which facilitates the development of contextually appropriate interventions.

Consider the theory of planned behavior. Briefly, according to the theory, the best predictor of a specific behavior is an intention or plan to engage in the behavior. Although it is understood that people do not always live up to their intentions, if a person does not plan to engage in a behavior, then it is highly unlike that he or she will engage in the behavior. Research has demonstrated a strong longitudinal relationship between intention and sexual behaviors, including condom use and abstinence. The theory also suggests that a behavioral intention is determined by attitude, subjective norm, and perceived behavioral control or self-efficacy regarding the behavior. Thus, people should intend to use condoms if they evaluate condom use positively, if they believe significant others think they should use condoms, and if they feel confident in their ability to use condoms.

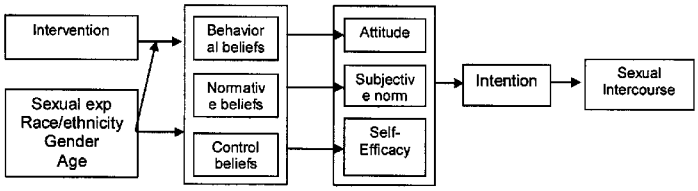

Figure 1. Theoretical model of individual-level mediation and moderation of intervention effects on sexual intercourse. It illustrates that external variables, including the intervention and the moderators, influence behavioral beliefs, normative beliefs, and/or control beliefs. An arrow from the moderators intercepts the arrow from the intervention to the beliefs, indicating that the moderators influence the effect of the intervention on these beliefs.

A valuable feature of the theory of planned behavior is that it directs attention to *why* people hold specific attitudes, subjective norms, and perceived behavioral control or self-efficacy. Behavioral beliefs about the consequences of engaging in the behavior determine attitude toward using them. For instance, adolescents may believe that sexual involvement may interfere with their ability to achieve their educational goals. With regard to condoms, people may believe that if they use a condom, their risk of sexually transmitted HIV infection or pregnancy will be reduced. On the other hand, they may believe that using a condom would interfere with sexual enjoyment. If I perceive that the consequences of a behavior are good, then I am more likely to engage in the behavior than if I perceive that the consequences are bad. Normative beliefs about important referents' approval or disapproval of the behavior determine subjective norm. These significant referents might include peers, parents, other relatives, church members, or sexual partners. Adolescents might be less likely to initiate sexual involvement if they understand that their parents would strongly disapprove of their having sexual intercourse. On the other hand, it may be difficult for adolescents to practice sexual abstinence it they believe that all of their friends approve of their having sexual intercourse. Control beliefs about factors that facilitate or inhibit condom use determine perceived behavioral control or self-efficacy. This might include beliefs about the availability of condoms. If people are embarrassed to purchase or carry condoms they may not have them available when they need to use them. Impulse control beliefs concern people's confidence that they can control themselves enough to use condoms when sexually excited. Perhaps most emphasized in HIV prevention research are negotiation beliefs, which concern the people's confidence that they can persuade their sexual partners to practice sexual abstinence or to use condoms. Technical skill beliefs concern the people's ability to use condoms correctly and without ruining the mood.

Several other factors may affect people's sexual risk behavior, including prior sexual experiences, race/ethnicity, gender, age, poverty, gender-role beliefs, parental monitoring and supervision, parent-child communication, religiosity, and alcohol and drugs use. According to the theory these are external variables. The effects on intention and behavior of variables external to the theory are seen as mediated by their effects on the attitudinal component, the normative component, the perceived control component, or all three. In other words, external variables, including an intervention, may affect variables that are a part of the theory and through a mediation chain, influence behavior. For instance, gender-role beliefs may influence a woman's confidence that she can negotiate condom use with her partner and may thereby affect condom-use intention and condom use. External variables may also moderate an intervention's efficacy. For instance, girls initiate sex at an older age than do boys, and girls have less power over the use of condoms than do boys. Accordingly, gender may both predict sexual debut and moderate the intervention's efficacy in increasing condom use.

Given the way in which the theory explains the impact of external variables, the theory offers a clear prescription for the development of an intervention. We could design interventions to affect behavioral, normative, and control beliefs and through a mediation process influence intention and the targeted behavior. The theory also suggested a strategy for identifying the relevant beliefs: namely, target the salient behavioral, normative, and control beliefs in the specific population. Researchers can use qualitative research methods, including focus groups, key informant interviews,

and elicitation studies, with the population to identify the salient beliefs. By targeting salient beliefs, an intervention may change attitude, subjective norm, and perceived self-efficacy, which would change intention, which, in turn, would change behavior. Identifying the population-specific salient beliefs serves to make the theory and the resulting intervention appropriate for the population. Perhaps most important, the theory suggested that the relative predictive power of the attitudinal, normative, and control components of the theory could vary from population to population. Thus, the prediction of a behavioral intention might be different in middle-class white college students as compared with low-income African American women as compared with African American MSM, but the theory might have predictive value in each of these populations.

In developing our interventions we have conducted several phases of research. First, we conduct qualitative research with the population or culture, not only to identify the salient behavior, normative, and control beliefs regarding the behaviors we seek to change, but also to identify the contexts in which the behaviors occurs. An understanding of the context is essential to developing an intervention that is appropriate to the population. For example, knowing that adolescents are more likely to have sex when they are home can help researchers develop role-play scenarios regarding refusal to have sex that seem authentic to the participants. The second phase of research is to develop and employ a questionnaire to confirm that the salient beliefs identified are, in fact, related to the behaviors of interest. The third phase is to use the information from the first two phases to develop an intervention. In other words, the qualitative information about the culture or population and the quantitative information from the survey are integrated with the theoretical framework to create an intervention that is both grounded in the theory and tailored to the population or culture. The fourth phase is to pilot test the intervention, collect comments and criticisms from the participants and facilitators, and then design the final version of the intervention. The fifth phase is to test the efficacy of the intervention.

Randomized controlled trials provide the most scientifically sound evidence for the efficacy of an intervention. We measure the success of our efforts to develop efficacious interventions by examining the quantitative and qualitative results of the randomized controlled trials. We typically have three specific aims in testing the efficacy of the intervention. First, we examine whether the intervention significantly improved sexual behavior outcomes, including abstinence, condom use, unprotected sexual intercourse, and multiple sexual partners. In some studies, we also examine whether the intervention influenced biological outcomes, that is, reduced the incidence of sexually transmitted infections. A focus on STI is important because it provides an outcome measure that is objective and less likely to be influenced by a socially desirable responding by research participants. In addition, it provides an actual health outcome for the intervention. Typically, our second aim concerns moderators of intervention efficacy: namely, whether the intervention is more effective with some participants as compared with others. For example, does the intervention have a better effect on adolescent boys as compared with girls, virgins as compared with sexually experienced adolescents, or single people as opposed to those in committed relationships? Or perhaps the intervention has a better effect when implemented in single-gender groups as compared with mixed gender groups or when the facilitator is the same gender as the participant. A third aim of our research is to test the mediation of the effects of the intervention on behavior: namely, if it changes behavior, why did it changed behavior, and if it did not change behavior, why it failed to change behavior. This is very important to future research to improve the intervention. This involves examining the theoretical mediators, that is, the beliefs the intervention targeted. Did the intervention actually have an impact on the beliefs it was designed to change? Were the beliefs related to the behavior we sought to change? By conducting this kind of mediation analysis a better understanding of why the intervention worked or did not work will emerge. Thus, we measure our success by examining whether the intervention changed behavior, whether it was more efficacious with some participants or under certain circumstances, and why it was or was not efficacious.

Here are some examples of studies we have conducted. In each study, we followed the five phases mentioned earlier in developing and testing the interventions. One randomized controlled trial tested the efficacy of clinic based HIV/STD interventions. African American and Latina adolescent girls at the adolescent medicine clinic of a children's hospital were randomized to one of three interventions focused on HIV/STD information, HIV/STD behavioral skill building, or general health promotion among, with 89 percent retained at 12-month follow-up (Jemmott, Jemmott, Braverman, and Fong, 2005). The skills building intervention participants reported less frequent unprotected intercourse and fewer sexual partners and were less likely

to test positive for an STD at 12-month follow up, as compared with the health-promotion control intervention. The efficacy of the intervention did not differ between the Latino as compared with the African American girls. We developed the "Sister to Sister" HIV/STD risk-reduction curriculum and evaluated it in a randomized controlled trial with Black adult women at a women's health clinic in Newark, NJ (Jemmott, Jemmott, & O'Leary, 2008). Among the 86.9 percent that returned for 12-month follow-up, those in the Sister-to-Sister intervention had reduced unprotected sexual intercourse and biologically confirmed STD rates as compared with those in the health control group.

In another randomized controlled trial, Jemmott, Jemmott, and Fong (1998) assigned 659 African American adolescents to an abstinence intervention, a safer sex intervention, or a health-promotion control intervention. About 98 percent attended all sessions of the two-session interventions, and 93 percent returned for the 12-month follow-up. The safer sex intervention significantly increased condom use compared with the control group at three-, six-, and twelve-month follow-ups. The abstinence intervention significantly reduced self-reported intercourse at three-month follow-up compared with the control group. This was the first randomized controlled trial demonstrating that an abstinence intervention was efficacious in reducing sexual involvement. The interventions were equally efficacious when implemented by peer co-facilitators as compared with adult facilitators.

Finally, we recently completed a randomized controlled trial developing and testing the efficacy of an HIV/STD risk-reduction intervention for young South African adolescents, "Let Us Protect Our Future" (Jemmott, Jemmott, O'Leary, Ngwane et al., 2008). We randomly selected nine matched pairs of schools and randomly allocated schools to either a HIV/STD risk-reduction intervention or a health promotion control intervention. Grade 6 students completed baseline, post-intervention, three-, six-, and twelve-month follow-up surveys written in Xhosa following translation and back-translation from English. We found that a significantly smaller percentage of students in the HIV/STD risk-reduction intervention reported having vaginal intercourse, unprotected vaginal intercourse, and multiple sexual partners, as compared with their counterparts in the health-promotion control intervention. The intervention's efficacy did not differ significantly between girls and boys. Thus, our intervention approach, which integrates qualitative information about a population with behavior change theory, can be applied successfully not only to diverse populations in the United States, but also to populations in sub-Saharan Africa where HIV is exacting its most devastating toll.

2. How might successful programs in behavioral interventions for AIDS prevention be scaled up, applied to other public health challenges, or otherwise used to better inform public policy?

Considerable evidence from studies here in the United States and abroad documents that HIV/STD risk-reduction interventions can reduce sexual risk behaviors in a wide range of populations, including adolescents, women, men who have sex with men (MSM), substance users, patients in clinic settings, and other persons at risk. To have the most impact on the HIV/AIDS epidemic, these successful preventive interventions must be scaled up. We would argue that interventions would be easier to scale up if the intervention developers consider the likely end-users of the intervention during the process of development. In this way, they are more likely to develop an intervention that can be widely used than if practical questions are not considered from the very beginning. For example, if we are to develop an intervention for a broad range of African American MSM, we should consider not only whether it will be most efficacious when implemented by African American MSM facilitators, but also how realistic is it to scale up an intervention for African American MSM that must be implemented by African American MSM facilitators. If we know that women are the most common case managers for African American MSM, it might be more practical to examine whether women could successfully serve as facilitators of an intervention for the population. Clearly, an intervention that could be implemented by either women or African American MSM would be easier to scale up than one that must be implemented by African American MSM. This is just one example; the point is that efforts to scale up may be most successful if scaling up is considered from the beginning.

Certainly, in the early years of HIV/STD risk-reduction research, the emphasis was appropriately on discovering interventions that could successfully change behavior. Now, that we know we can develop interventions to change behavior it is appropriate to shift the emphasis and focus on the development of interventions that can be scaled up. Several issues need to be considered when we focus on scaling up, among them are adaptation, adoption, and effectiveness of interventions.

Research is needed on the how to adapt evidence-based interventions to meet the needs of different communities. This is important because to adapt is to change, and change may mean creating a new intervention that may or may not retain the efficacy of the evidence-based intervention. Research is needed to understand how to adapt interventions for new populations or settings while retaining the qualities that made the interventions efficacious. In this connection, a distinction is sometimes drawn between core elements of an intervention and key characteristics of an intervention. Core elements are aspects of an intervention that are considered essential to its efficacy and therefore should not be changed, whereas key characteristics are not essential to achieve efficacy and therefore can be modified. More research is needed to more fully understand which aspects of interventions are truly core elements and which are merely key characteristics.

Research is needed on why evidenced-based interventions are or are not adopted. Although successful interventions are published in scientific, medical, and public health journals and therefore brought to the attention of researchers, academics, and professionals, the majority of service providers who work closely with populations at risk may remain unaware of the interventions. Thus, efforts must be made to disseminate successful interventions to likely end-users. The question then becomes whether these service providers decide to adopt the evidence-based intervention. The fact that service providers know that an intervention successfully changed behavior in a study does not necessarily mean that service providers will immediately adopt it. Other considerations figure in the decisions of service providers to use a given intervention. Research is needed into these decisions in order to devise effective strategies to encourage the adoption of evidence-based interventions. This may include research into ways to train service providers to implement the intervention, identifying and providing appropriate kinds of technical assistance, identifying barriers to adopting the intervention among all relevant constituencies. Examples of such barriers are funding, reasonable salaries for talented staff, high rates of turnover, organizational mission, and inadequate organizational capacity or infrastructure.

A third type of research needed concerns the effectiveness of evidenced-based interventions when they are disseminated. Such studies are sometimes called Phase IV trials and distinguished from Phase III trials designed to test the efficacy of interventions. Although carefully controlled Phase III studies employing well trained and monitored facilitators who adhere to the intervention protocol strictly may demonstrate that an intervention is efficacious, it does not necessarily mean it will be effective when implemented under less controlled real world circumstances. Thus, Phase IV trials are needed to identify factors that affect the effectiveness of interventions when implemented by service providers with their client populations in their settings. These factors could then be taken into account both in the development of future interventions that can be more successfully scaled up and in the training of providers in the use of interventions. Examples of factors that might affect the effectiveness of an intervention are characteristics of the organization, including organizational mission, the type of training the service providers receive, technical assistance, supervision of staff, and staff turnover.

Here is an example of a Phase IV effectiveness trial. After conducting several Phase III trials of the efficacy of the Be Proud! Be Responsible! intervention, we conducted a Phase IV trial of its effectiveness when implemented by service providers at community-based organizations (CBOs) serving African American adolescents 13 to 18 years of age. We randomized 86 CBOs to implement "Be Proud! Be Responsible!" or a control health promotion intervention on diet and physical activity. In addition, we randomly assigned the CBOs to receive three different amounts of training. Each CBO implemented its assigned intervention with six groups of adolescents (N=3,448), and we randomly selected three of the six to complete three-, six-, and twelve-month follow-up surveys (N=1,707). We found that adolescents who received the HIV/STD intervention were more likely to report consistent condom use than were those who received the health-promotion control intervention. In addition, the effectiveness of the intervention did not improve significantly when the CBOs were given more expensive and labor-consuming training. This finding suggests that an HIV/STD risk-reduction intervention whose efficacy has been established can be effective when implemented by CBOs, which play a critical role in the delivery of HIV/STD prevention services worldwide. Moreover, the training of the CBOs need not be especially expensive or labor-intensive to achieve desirable outcomes.

The findings from research on behavioral interventions to prevent HIV can be applied to other public health challenges. The leading causes of morbidity and mortality in the United States and in most parts of the world are health problems that are either caused by or affected by behavior and whose treatment or course are influenced by behavior. National health organizations throughout the world as well

as international organizations all offer similar behavioral guidelines on how to reduce the risk of leading causes of premature death. These include guidelines regarding not only sexual behavior but also cigarette smoking, healthful diet, physical activity, alcohol consumption, and other use of other substances, screening behaviors, and treatment adherence. Given the focus on behavior, the same type of focus on behavior change theory and tailoring to the population is likely to be successful in efforts to address these other pressing public health issues.

We can say this with confidence because although we are primarily HIV/STD risk-reduction researchers, in all of our studies we also include a control group that receives an intervention. A common control group intervention is a health promotion intervention that focuses on how chronic diseases can be preventing by engaging healthful behavior. This usually involves focusing on fruit and vegetable consumption and physical activity as a means to reduce the risk of hypertension, heart disease, obesity, and certain types of cancer. In developing these chronic disease prevention strategies we employ the same phases of research as in developing the HIV/STD interventions. Thus, we conduct qualitative research to identify salient behavioral, normative, and control beliefs and the context of the behaviors and then integrate the information with our theoretical framework to develop the intervention. An example of the success of this approach is the trial we recently completed in South Africa with grade 6 students. Our health promotion intervention was efficacious. Students who received the health promotion intervention reported more fruit and vegetable consumption and more physical activity over the twelve-month follow-up period than did those who received the HIV/STD risk-reduction intervention.

3. Please provide an overview of the range of topics addressed by the Behavioral and Social Sciences division of the Penn Center for AIDS Research. What is the nature of the relationship between your division and the Center's other divisions in biological sciences and clinical research? How might social and behavioral research be used more effectively to guide or take advantage of biomedical research and vice versa? Given the potential for behavioral interventions to prevent the spread of HIV/AIDS and many other diseases, is the Federal Government investment in behavioral research reasonable relative to its total investment in research to prevent and treat these diseases?

The Behavioral and Social Sciences (BSS) Core of the Penn Center for AIDS Research (CFAR) focuses on studies of risk behavior and outcome research as well as studies of epidemiologic, economic, and bioethical aspects of AIDS. Additional goals of this group are to develop strong linkages with the academic community of the University outside the Medical Center in order to establish a broad-based and comprehensive program in AIDS research. More specifically, the BSS Core services are guided by and designed to promote the following set of scientific priorities and principals: 1) Contextual circumstances (social, sexual, and drug using networks; community; geography) within which HIV transmission occurs and infection exists are crucial factors to understanding and responding to risk of infection, access and adherence to treatment; 2) Behavioral sciences have a critical role to play in the design and evaluation of clinical trials of both behavioral and biomedical interventions (microbicides, vaccines, and therapeutics); 3) Linkages between investigators (behavioral, clinical and basic), locally, domestically, and internationally is critical to the development of sustainable programs of innovative and meaningful AIDS research.

Members of the BSS Core have an impressive history of productivity over the past 20 years and continue to be active in the behavioral and social science aspects of AIDS. The work of these faculty include the development of important and widely applied theory, the design and implementation of theoretically based prevention interventions, and leadership and participation in multi-site clinical trials of behavioral and biomedical interventions. The BSS Program has a rich portfolio of active AIDS research characterized by close collaborations among program members and between CFAR programs. The following provides a brief overview of the current work of the program with particular emphasis on those studies that the CFAR has been instrumental in facilitating.

International HIV Prevention Research

BSS program members have been actively involved in an expanding international research agenda. In collaboration with Penn investigators, the University of Botswana was recently awarded a capacity building grant by NICHD. Botswana has the second highest rate of HIV/AIDS in the world. A limited capacity and infrastructure for rigorous HIV/STD prevention research has hampered efforts to curb the spread of sexually transmitted HIV infection among adolescents in Botswana. Accordingly, the broad long-term objective of the grant is to build capacity and infra-

structure to develop, implement, and evaluate culturally competent, developmentally appropriate, sustainable interventions suitable for implementation in a variety of settings to dissuade Botswana adolescents from engaging in behaviors that increase their risk for sexually transmitted diseases (STDs), including HIV. This grant is a collaborative effort of a multi-disciplinary team of researchers at the University of Botswana and the University of Pennsylvania to build such capacity and infrastructure at the University of Botswana. It is directed by Bagele Chilisa at the University of Botswana and John Jemmott at the University of Pennsylvania. The capacity building is organized around three cores. Qualitative and Quantitative Methodology Core, Social and Behavioral Intervention Core, and the Administrative Core. In addition, three research projects that draw upon the cores to address adolescents in different settings were proposed: School-Based HIV/STD Prevention, Church-Based HIV/STD Prevention, and HIV/STD Prevention for Adolescents Living with HIV. The Principal Investigator of each core and research project is a University of Botswana faculty member and the Co-Principal Investigator is a University of Pennsylvania faculty member. Penn BSS Core faculty involved in the Botswana project include J. Jemmott, L. Jemmott, Metzger, Fishbein, Blank, Heeren, Teiltelman, Coleman, and Stevenson. In addition to the University of Botswana collaboration, Jemmott and Jemmott are implementing an NIMH funded school-based prevention program in South Africa and an NICHD-funded cluster-randomized controlled to test the efficacy of a HIV/STD risk-reduction intervention among adult men in 48 randomly selected neighborhoods in Eastern Cape Province, South Africa.

George Woody's work evaluating naltrexone treatment for high risk heroin injectors in St. Petersburg has led to currently funded studies of naltrexone implants in St. Petersburg and methadone treatment among HIV positive heroin users in Ukraine. Woody is conducting a NIDA supported randomized trial examining the efficacy of oral naltrexone (an opiate antagonist) with and without fluoxetine for relapse prevention to heroin addiction in St. Petersburg, Russia. This study is being done in collaboration with investigators from the Pavlov State Medical University and the Leningrad Regional Center for Addiction Treatment. An important component of this research is the measurement of HIV risk behavior since intravenous drug use is the primary route of HIV transmission in St. Petersburg. The findings thus far suggest significant reduction of heroin use and injection related risk behaviors among those receiving naltrexone. Adherence rates for naltrexone are also substantially higher than those found in prior studies of naltrexone. A supplement to the Penn CFAR has extended the St. Petersburg work to study co-morbidities between alcoholism, heroin addiction, TB, hepatitis and HIV. These projects have laid the groundwork for a CIPRA application to fund an HIV education, treatment, prevention and research center at Pavlov. Woody has an ongoing collaboration with researchers at the University of Rio Grande do Sul in Porto Alegre, Brazil. This group recently reported the results of a sero-incidence study modeled after the longitudinal work being conducted in Philadelphia, among cocaine users in Porto Alegre. The study estimates an HIV sero-incidence rate of 5.03/100 person years of follow-up. The findings of the work have formed the basis further prevention initiatives in Porto Alegre including the recent submission of a CIPRA application to establish a collaborative HIV research center.

David Metzger is the protocol Chair for the HPTN 058, the first randomized trial of drug treatment (suboxone) using sero-incidence as an endpoint. He is also an investigator on a NIDA supplement (Richard Schottenfield PI; Yale University) to evaluate Behavioral and Drug Risk Counseling in methadone treatment in Wuhan, China. The work in Wuhan has evolved from and earlier collaboration with WenZhe Ho and investigators from the Chinese CDC, which examined changes in immune function during detoxification at a detoxification center in Wuhan. Metzger has also completed research on ACASI risk assessments with Brazilian collaborators during the funding period. Metzger has been collaborating on several projects designed to develop assessments of HIV risk behaviors in Brazil. In Porto Alegre, the Risk Assessment Battery was adapted and evaluated for validity and reliability and in Rio De Janeiro an ACASI risk assessment has been developed an evaluated for use with drug using populations entering treatment.

Toorjo "TJ" Ghose, is a new investigator in the School of Social Policy and Practice, having joined the Penn faculty in 2007 after completing post-doctoral training at the Center for Interdisciplinary Research on AIDS (CIRA) at Yale University. He has recently been funded as part of the Penn CFAR Pilot study program to conduct a project entitled "Implementing PATH India: Reducing HIV risk among the dually-diagnosed in India," building on the work done domestically by Blank. This research examines HIV risk among treatment seekers at the All India Institute of Medical Sciences (AIIMS) in New Dehli who have been dually diagnosed with a mental health and substance use disorder. The pilot study comprises two phases, a first

phase in which knowledge, attitudes, and risk behaviors are assessed for 200 persons, and a second phase in which PATH is translated and pilot tested for 20 persons in a randomized pilot study. Collaborators at AIIMS have been working with Ghose, an Indian native, for several years and have been full partners in the development of the pilot study.

Hans-Peter Kohler, a sociologist, Susan Watkins, a sociologist, and Jere Behrman, an economist, of the Population Studies Center, are leading an investigation of partnership patterns among couples in Malawi. This work, which received CFAR developmental funding initially and is now supported with NICHD funds, is built upon a longstanding social network research initiative Kenya. The goal of this project is to examine the role of networks in changing attitudes and behavior regarding family size, family planning, and HIV/AIDS in Malawi. The project focuses on two key empirical questions: the roles of social interactions in (1) the acceptance (or rejection) of modern contraceptive methods and of smaller ideal family size; and (2) the diffusion of knowledge of AIDS symptoms and transmission mechanisms and the evaluation of acceptable strategies of protection against AIDS (69–72). Behrman also has grant support from NICHD to examine how economic transfers that provide support for dependent children and elderly are affected in a context in which HIV/AIDS and poor health has weakened traditional support networks. Tukufu Zuberi, a sociologist and demographer in Penn's Population Research Center, directs the African Census Analysis Project in collaboration with social scientists, demographers, and public health specialists in 14 African countries. This project provides CFAR investigators working in Africa with access to university resources including survey research resources and public health populations and HIV testing facilities. An important focus of the Census project is the demographic impact of the HIV epidemic in Africa. Mark Pauly, professor of economics at the Wharton School, is funded by a Fogarty award to collaborate with colleagues at the University of Natal in Durban, South Africa to assess the impact of poor health and HIV/AIDS on small businesses and the local economies where they are located in South Africa.

Health Services and Policy Research

Although much of the work described above has important implications for HIV policy regarding prevention and care, a number of faculty have been involved in policy specific research. Policy related investigations by BSS program members have focused on access to care for HIV positive individuals and the structure of health care delivery. Dr. Barbara Turner's work has documented substantial deficiencies in the care of HIV+ persons nationally. Linda Aiken's research group has made important contributions to the development and evaluation of AIDS prognostic staging measures for use in controlling for severity of illness in the evaluation of treatment effects, in understanding the impact of organization of AIDS services on outcomes of care, and assessing racial disparities in AIDS health services and outcomes. Dennis Culhane of the School of Social Work, the Population Studies Center, and the Center for Mental Health Policy Research has examined the relationship between AIDS and homelessness in Philadelphia by integrating the City's administrative data bases for AIDS surveillance and public shelter utilization. Martin Fishbein has had a major influence on HIV prevention through the development and application of the Theory of Reasoned Action which he co-developed. He has been very active in research designed to test this theory in community trials including "Project Respect" which has greatly influenced HIV counseling strategies both domestically and internationally. He has continued to urge HIV behavioral research to recognize the important role theory in prevention and the need to integrate behavioral and biological measures in a rational manner. Currently he is leading a five year research effort designed to examine the link between exposure to sexual content in the media and sexual risk behaviors among adolescents.

The BSS program includes several key faculty who have been important in the national and international response to the AIDS epidemic and who, although their work is not currently centered on AIDS research, are important resources to the program. Robert Boruch, a social statistician in the Graduate School of Education, chaired the National Research Council (NRC) Committee on AIDS Research and the Behavioral, Social, and Statistical Sciences's Panel on the Evaluation of AIDS Interventions. Boruch co-edited the NRC volume, Evaluating AIDS Prevention Programs. He is Director of the Campbell collaborative and a major voice in the public policy research, design and analyses. Robert Hornik, a noted social scientist in mass media communication and behavior change at Penn's Annenberg School of Communications, was a central participant in the AIDS Public Health Communications Program (AIDSCOM), and evaluated mass media interventions to prevent the spread of AIDS in Uganda, Zambia, Ghana, and Dominican Republic. Hornik has evaluated AIDS education and communication programs for WHO's Global Program on AIDS.

Hornik and Fishbein, at Annenberg, have evaluated the impact of the mass media anti-drug campaign supported by the White House Office on Drug Control Policy.

Intervention Development and Testing with Adolescents

John Jemmott's work has made significant contributions to HIV prevention theory and practice among high-risk African American adolescents in community-based settings. He is currently directing a very active program of prevention research. As the director of the Center for Behavior and Health Communications Research, Department of Psychiatry, School of Medicine, Jemmott and his group are leading a randomized controlled trial investigating the efficacy of abstinence and safer sex interventions with inner-city grade six and seven African American adolescents. One important result of that study was that a theory-based culturally tailored abstinence-only intervention reduced sexually intercourse during a 24-month follow-up period as compared with a health promotion control group. This is the first study to document an efficacious abstinence-only intervention over a two-year follow-up.

Loretta Sweet Jemmott continues to conduct research focused on identifying modifiable psychological factors that underlie behaviors that lead to risk for sexually transmitted HIV infection among urban African Americans, and on designing and testing theory-based, culturally sensitive, developmentally appropriate interventions to reduce those risks. She has also conducted a number of theory-based descriptive studies that use theoretical frameworks to predict risky sexual behaviors among adolescents. She has been funded by the NINR to coordinate a partnership with the Hampton University School of Nursing designed to develop and evaluate strategies intended to narrow the gap in health disparities between American citizens of different ethnic and racial origins. Sweet Jemmott is leading a randomized trial of a theory based an abstinence-only intervention with parents and their adolescent children identified through black churches in Philadelphia.

Subsequent to pilot funding through the Developmental Core, Anne Teitelman was successful in securing a K01. This Career Development Award will to establish a rigorous academic foundation for a research career devoted to developing and testing novel interventions for reducing HIV risk for adolescents. Thematically, the K01 will address the social context of HIV risk by integrating effective theory-based adolescent HIV prevention with promising partner abuse prevention strategies, emphasizing promotion of healthy relationships. It uses family planning clinics as a venue for providing a skill-based, culturally-tailored HIV and partner abuse prevention educational and advocacy program for African American girls living is economically disadvantaged circumstances. Partner abuse, which significantly increases risk for HIV, disproportionately affects low income African-American adolescent girls, as does HIV. Critical to this project is the candidate's demonstrated ability to conduct HIV/STD research in partnership with minority communities, a long-term engagement in interdisciplinary scholarship aimed at improving health and a 20-year history as a primary care provider. The research plan is divided into two phases, both guided by social cognitive and gender theory. In phase 1 she will conduct focus groups and individual interviews in order to develop and tailor the HIV/partner abuse intervention for adolescent girls and in phase 2 she will evaluate the initial acceptability and feasibility of this intervention in a limited RCT. Dr. Tetitelman's mentors on this project include BSS program members L. Jemmott and J. Jemmott.

Intervention Development and Testing with Couples

J. Jemmott and his group are leading a major NIMH funded four-city multi-site cluster-randomized intervention trial on sexually active HIV serodiscordant African American couples. Couples in which one person has HIV and the other does not are randomly assigned to a sexual risk reduction intervention or a chronic disease prevention control intervention. Participants provide biological specimens for STD assays and compete ACASI at baseline, immediately post-intervention, and six and twelve months post-intervention. Thus far, the study has achieved very high retention rates in this high risk population, over 90 percent have completed the twelve-month follow-up assessment. The project involves BSS program members as co-investigators (Metzger, L. Jemmott, and Maslankowski) and receives services from the Clinical Core and the BSS Core in recruitment and assessment support. The data coordinating center for this multi-site trial is being directed by J. Richard Landis of the Biostatistics Core.

Intervention Development and Testing for Persons with Mental Illnesses

Michael Blank examines mental health and substance abuse and relationships with HIV risk. His previous research with the SMI population has demonstrated high rates of both psychiatric and general medical comorbidity. Likewise, the HIV

positive population has dramatically elevated rates of mental illness and other physical co-morbidities. Blank's work has been substantially impacted by the Penn CFAR resulting in two R01 awards, and R13 to support three national scientific meetings of the SBSRN, and a U18 from the CDC in collaboration with investigators from the University of Maryland to examine implementation of HIV testing in community mental health settings. This work has evolved with investigators from the Center for Mental Health Policy Research and the Center for Health Outcomes and Policy Research at the School of Nursing (Aiken). These projects evolved from analyses of Medicaid claims data that found that the relative risk of HIV/AIDS is at least five times greater in persons with serious mental illness (SMI) relative to the general Medicaid population in Philadelphia and over seven times greater for those also treated for substance abuse. A cost study linked to these data showed that SMI with HIV had much higher health care costs than non-SMI persons with HIV and non-HIV persons with SMI. Based in part on these findings, and with co-investigators Aiken, Hines, Fishbein, Gross, Rothbard, and TenHave, Blank has been conducting an NINR funded investigation to study the effectiveness of integrating advanced practice nursing into ongoing Targeted Case Management (TCM) to enhance adherence to treatment regimens among persons with serious mental illness (SMI) who are also HIV positive. The work is built around a Public-Academic Liaison (PAL) model involving mental health services researchers from a number of specialized research centers at the University of Pennsylvania, with the public health and mental health programs in the City of Philadelphia.

Blank has also has been conducting a randomized community trial of a preventive intervention delivered by mental health case managers in a one-on-one format for persons with SMI who also abuse substances. The intervention entitled, Preventing AIDS Through Health (PATH) is an evidence-based intervention that integrates features from the CDC project Respect to encourage safer sexual practices and promote condom use with aspect of the NIDA Community-based Outreach Model to reduce risk of blood-borne infections resulting from substance abuse. Co-investigators for this work include Fishbein, Metzger, Hadley, Solomon, Rothbard, and Ten Have.

Blank has also been directing a multi-site U18 project from CDC to increase HIV testing and improve linkage to care for HIV-infected in community mental health settings with large numbers of numbers of African Americans. Using a six-month longitudinal design, he will be enrolling participants who meet inclusion criteria for assessment, counseling, and Rapid HIV Testing at baseline. These participants will be interviewed again at six months post intervention. The study is designed to evaluate changes in HIV risk behaviors, linkages to HIV care, and subsequent use of mental health services. As the primary coordinating institution, the Penn research team will be collaborating with a mix of three types of facilities in Philadelphia and Baltimore, through our collaborators at the University of Maryland. Target facilities in both cities include university-based inpatient psychiatric units, Community Mental Health Centers (CMHCs), and Assertive Community Treatment (ACT) programs.

Intervention Development and Testing for Persons who Abuse Substances

L. Jemmott is leading a randomized trial of a theory based sexual risk reduction intervention targeting African American women in drug detoxification. BSS program members who serve as co-investigators include J. Jemmott and Metzger. The intervention will be evaluated using STD incidence and self-reported sexual behavior as measured via ACASI.

Philippe Bourgeois joined Pen and the CFAR BSS Program in 2007 as the fifth Penn Integrates Knowledge (PIK) Professor. PIK Professorships are awarded to exceptional scholars whose research and teaching exemplify the integration of knowledge across academic disciplines. Dr. Bourgois has earned international acclaim for his ethnographic research with drug abusers. He has devoted much of his recent research to the prevalence of violence and disease among homeless drug abusers in San Francisco. Bourgois's books include In Search of Respect: Selling Crack in El Barrio, which received the 1996 C. Wright Mills Prize from the Society for the Study of Social Problems of the American Sociological Association and the 1997 Margaret Mead Award from the American Anthropological Association and the Society for Applied Anthropology. Bourgois is currently funded to examine the HIV and HCV risk implications of the growing phenomenon in the United States of prematurely geriatric substance abusers by examining the aging process among both young and older injectors. He is contributing to a socio-culturally contextualized understanding of variance in HIV and HCV infection rates among differentially vulnerable profiles of street based IDUs that is informed theoretically at the macro-structural level. A cross-generational and multi gender ethnographic team will collect qualitative data inside the shooting/sleeping encampments and income generating territory of two

overlapping social networks of injectors (core N = 25–40 at any given time; peripheral N = 50–70). The project extends its ongoing collaboration with epidemiologists to clinical researchers and researchers and caregivers who work with comparable data sets of injectors in San Francisco in order to engage a multi-method dialogue. An immediate applied goal is to promote communication across the research/service interface. We will offer providers of health care, outreach and treatment an indigenous perspective on the effectiveness of their services among substance abusers by age cohort through our comparative study of: 1) injectors from the baby boom generation who are advancing from mid-life to old age with rapidly deteriorating health and ongoing HIV risk; and 2) homeless youth injectors (many of whom are the children of middle-aged substance abusers) who engage in risky injection and sexual practices.

Charles Dackis, MD, an experienced researcher in substance abuse treatment has recently been supported by NIDA to conduct a trial to evaluate the efficacy of modafinil as a treatment for cocaine dependence in women, and as a means of reducing high-risk behavior (HRB) that increases the likelihood of HIV seroconversion. Modafinil, a wake-promoting medication that is approved for narcolepsy, has a low abuse potential despite its alerting effect. Modafinil also blocks cocaine-induced euphoria under controlled conditions [2, 3] and may reverse clinically significant cocaine-induced neuroadaptations. An effective pharmacological treatment for cocaine dependence should also reduce HIV seroconversion by diminishing unsafe sexual practices that often accompany cocaine procurement. Cocaine enhances sexual arousal and increases reckless sexual activity, including trading sex for cocaine with multiple partners. Cocaine-addicted women who engage in this dangerous practice are particularly vulnerable to HIV seroconversion and in need of effective treatment. Needle sharing by intravenous cocaine users is another avenue of HIV transmission that could be targeted by effective treatment.

Intervention Development and Testing using Media Communications

Martin Fishbein is Harry C. Coles Jr. Distinguished Professor in Communication at the Annenberg School and is internationally recognized for his theoretical work in behavior change theory and relationships to risk behavior such as HIV. He is currently funded to examine media influences on risk behavior among adolescents. The media is a pervasive institutional structure in all modern societies. It has often been argued that the media industry encourages unsafe sex by irresponsibly portraying sexual behaviors. As a result, it is widely claimed that youth are negatively influenced by what they see, hear, and read in the media. There is, however, very little evidence to either support or refute this hypothesis. Historically, sexual portrayals in the media, like violence, have raised the ire of advocates, policy-makers, and parents dating back to the first mass media marketed to children. Today, the issue remains an important agenda item and has led to public health policy interventions such as V-chip ratings and technology legislation, movie ratings, and video game advisories. Yet few studies of the "effects" of mass media on specific behaviors are done due to theoretical, logistic, design, and cost considerations. One specific reason for this is that much "media influence" is designed to shape and perpetuate consumer preferences and is therefore not targeted to behaviorally-defined groups but rather to the mass consumer public. But other kinds of media effects predicated on the principles of social learning theory and other theories can be predicted for specific "audiences" and specific behaviors. This application focuses on the media's role in presenting sexual content, implying sexual norms, modeling sexual decision-making ("self-efficacy"), and displaying the outcomes of sexual behaviors in relation to young adolescents, a group whose attitudes, norms, self-efficacy, and decision-making skills are all in flux and development. This five-year research project is the first to combine behavioral theory, communication theory, and a state of the art content analytic approach to investigate the relationship between exposure to sex in the media and early initiation of sexual intercourse and other sexual behaviors. Using this approach, the project will develop both objective (i.e., content analytic) and subjective, theory-based measures of (a) the quantity and content of adolescent's exposure to sexual media and (b) adolescents' sexual behavior and its underlying psychosocial determinants (i.e., beliefs, attitudes, norms, self-efficacy and intention). These measures will be tested for their reliability and validity, and they will take developmental, gender and ethnic differences into account. Based on this formative research, the project comprises a three-wave longitudinal proof of concept study to investigate the empirical link between exposure to sexual content in a broad variety of media (i.e., television, movies, music CDs, the Internet, video games, and magazines) and sexual behavior. In summary, this research uses a theoretically grounded, methodologically sound approach to more fully examine the relationships between media exposure and AIDS-related sexual behavior.

Intervention Development and Testing with MSM

John Jemmott is currently conducting an NIMH funded study to develop, implement, and evaluate the efficacy of an HIV/STD risk reduction intervention for African American MSM. This is a collaborative effort by HIV/STI university-based researchers and Blacks Educating Blacks About Sexual Health Issues (BEBASHI), the oldest community-based organization (CBO) in the City of Philadelphia that has addressed HIV in the African American community, including MSM. The participants will be 594 African American MSM who will be randomized to a one-on-one sexual risk reduction intervention, "Being Responsible for Ourselves (BRO)" or a one-on-one health promotion intervention that will serve as the control condition. This study will provide an urgently needed intervention to reduce the risk of HIV and other STIs in one of the highest risk populations in the United States. Christopher Coleman, who holds a joint appointment with the School of Nursing and the Medical School, is a co-investigator on John Jemmott's MSM intervention study, has a longstanding research interest in HIV positive MSM.

William Holmes' research has focused on modeling the relationship between childhood abuse and risk behaviors among MSM populations. More men with than men without childhood sexual abuse (CSA) histories report sexual behavior that has high risk for HIV transmission. His work has found that co-morbid post traumatic stress disorder (PTSD) and depression acts as both a mediator and a moderator of the association between CSA and sexual risk behavior. In his current NIMH funded study entitled, "Interaction of abuse, PTSD, depression on men's sex risk," data from a cross sectional, random-digit-dial (HDD) survey of 1,200 men from high AIDS prevalence areas of Philadelphia County will be used to test the model he has developed to explain the mediating/moderating pathway between CSA and lifetime sexual risk behavior in men. From this model, multidimensional HIV risk reduction interventions can be built.

Integrated Biomedical and Behavioral Trials

David Metzger is the PI of the Penn Prevention Clinical Trials Unit, funded by NIAID and a research site for the HIV Vaccine Trials Network (HVTN), the Microbicide Trials Network (MTN) and the Prevention Trials Network (HPTN). This award in 2006 was built upon its successful involvement as a site for the HIV Network of Prevention Trials (HIVNET) and subsequently, the HIV Prevention Trials Network (HPTN). The Penn Prevention Clinical Trials Unit is one of 60 international and domestic trials units selected to develop and test behavioral and biomedical prevention interventions. The Penn Prevention CTU includes co-investigators from the School of Nursing (Loretta Sweet Jemmott), the Infectious Diseases Division of the School of Medicine (Ian Frank), the Department of Immunology of the Children's Hospital of Philadelphia (Steven Douglas), and the Annenberg School of Communication (John Jemmott). The Penn Prevention CTU and its predecessor, the HPTU have made significant contributions to the research agenda of the HIV Clinical Trials Network and is currently involved in three active protocols: 1) the HVTN 502, the "STEP" study testing the ; 2) HVTN 070, and 3) HPTN 035, a large international Phase IIb trial of Pro2000 (entry inhibiting gel), and Buffer Gel (a buffering gel which inactivates virus). Penn's work in testing vaginal microbicides is led by Lisa Maslankowski. David Metzger, the PI of the Penn Prevention CTU also serves as the Chair of HPTN 058, a randomized trial of suboxone treatment for opiate addiction as HIV prevention taking place in Thailand and China.

Courtney Schrieber received a developmental award to study pregnancy during clinical trials using a nested case-control method and a point-of-care questionnaire. This area of inquiry is unique and important because incident pregnancies are significant and a somewhat unexpected finding in NIH supported Phase II and III vaginal microbicide and vaccine trials that can serve a biomarker of risk behavior. Further, because the teratogenicty of investigatory vaccines and microbicides are unknown, thus pregnant women are dis-enrolled from these studies which may introduce bias in the studies as those at greater risk may be dis-enrolled more frequently. Reducing pregnancy rates during trial participation will help avoid the associated methodological complications and potential health risks. Schrieber seeks to explore the risk factors for pregnancy among trial participants in order to inform efforts to both identify characteristics of women who are likely to become pregnant during the study and to prevent pregnancy for trial enrollees.

Relation Between the Behavioral and Social Science (BSS) Core and Other CFAR Programs: Building Research Collaborations

The BSS Program has encouraged collaborations among program members and between CFAR programs. This was evidenced in many of the projects already de-

scribed that are led by members of the core. In addition, BSS Core members in conjunction with members of the immunology program (Douglas and Ho) are currently investigating the role of host factors on viral activity HIV and HCV infected individuals. This work, facilitated by the Penn CFAR, perhaps best exemplifies the program goal of cross discipline collaborations and have developed a productive program of research over the past five years. Dwight Evans' research involving HIV infected men prior to the advent of HAART, provided the first indication that stress was not only predictive of early HIV disease progression but was associated with alterations in immunity, suggesting that stress influences disease progression by altering key aspects of cellular immunity. His study of HIV infected women conducted in collaboration with Steven Douglas and David Metzger extended the understanding of these relationships and provided the first evidence that depression may alter the function of killer lymphocytes in HIV infected women. Evans' recently completed grant entitled "HIV in Women: Depression and Immunity" further explored these relationships and the ex-vivo impact of anti depressants among HIV infected women with depression. Metzger's research group had responsibility for screening, recruitment, and specimen collection and Douglas's lab conducted immunologic assays. This work demonstrated that resolution of depression is associated with restoration of NK cytotoxicity in HIV and found that ex-vivo treatment of lymphocytes with an SSRI enhances NK cytolytic activity. These findings were the basis of a recent NIMH award to Evans. This new study is designed to test whether depression is associated with non-cytolytic, chemokine and cytokine, functional alterations of killer lymphocytes, as well as chemokine receptor sensitivity of macrophages and T-cells that are relevant to HIV-infectivity. The potential for impact of alcohol and opiates on HIV viral activity has also led to investigations of the mediating role of substance use on immune function among well characterized HIV infected individuals with Douglas and Ho. NIDA funded work on the relationships among opiates, substance P and HIV viral activity have found that methadone in vitro enhances infection of immune cells. With supplemental funds from NIDA this work was extended to examine factors associated with HCV activity. Using this model of collaborative research where behavioral scientist identify and assess well defined subject characteristics and deliver specimens for intensive and innovative analyses, Metzger's group is working with Douglas to examine the impact of alcohol abuse and dependence on viral activity and immune function.

The collaborative capacity building project between the University of Botswana and the University of Pennsylvania is organized around three cores. Qualitative and Quantitative Methodology Core, Social and Behavioral Intervention Core, and the Administrative Core. The project draws upon members of the CFAR Biostatistics Core, including Dr. Susan Ellenberg and the CFAR Administrative Core, including Dr. James Hoxie. This partnership is committed to developing a creative, comprehensive and interdisciplinary HIV/STD prevention research program on adolescents that is fully integrated within the research and education mission of the University Botswana and dedicated to addressing the urgent need to stem the devastating impact of HIV on one of the highest risk adolescent populations in the world.

Effective Use of Social and Behavioral Research

HIV/AIDS remains the most important public health problem facing our global community. Since the first cases of AIDS were reported in 1981, infection with HIV has grown to pandemic proportions, with an estimated 65 million infections and 25 million deaths. To be sure, we now have effective treatment of HIV infection with highly active anti-retroviral therapy (HAART) even in countries with limited resources. Still, these treatments do not reach all who need them, especially in low-resource countries and prevention is more cost effective than is treatment. Accordingly, there is a great need for effective behavioral strategies to reach and serve all persons who could benefit from treatment and prevention services.

As with many health problems today, behaviors—for instance, practicing abstinence, limiting sexual partners, using condoms, using clean IDU equipment, and adhering to treatment regimens—are central to the spread of HIV and to the efficacy of treatment. Accordingly, an approach that integrates the lessons from behavioral and biomedical science is likely to be most effective in stemming the HIV pandemic. As biomedical advances are made, social and behavioral science contributions will be required to ensure the success of new biomedical prevention technologies and treatments, including microbicides and vaccines. For example, social and behavioral science research would contribute to an understanding of whether the technologies and treatments are acceptable to populations, whether new behaviors will be adopted, and the facilitators and barriers to optimal treatment adherence.

Adequacy of Federal Funding

The Federal Government's investment in behavioral research on HIV has not been sufficient. Although the CDC has a number of dissemination initiatives, not enough funding has been allocated to result in the widespread use of interventions that we know are efficacious. If these interventions are effective when disseminated and if they were widely disseminated then we would not be witnessing the high rates of HIV that we are still seeing in the United States. Second, there are still important gaps in the portfolio of intervention strategies. African American MSM have the highest rates of HIV in the United States. Indeed, the rates of HIV among African American MSM rivals those seen in countries in sub-Saharan Africa, the region with the highest rate of HIV in the world. The CDC still does not have interventions for African American MSM with evidence of efficacy in reducing risk behavior and STD from randomized controlled trials to offer service providers who work with this population. Thus, additional funding is needed urgently for behavioral research on dissemination of efficacious interventions, including the adaptation, adoption, and effectiveness of those interventions. In addition, funding is also needed for interventions for populations, including African American MSM, where efficacious interventions are lacking.

The present funding environment for behavioral research on HIV is tough. It is extremely difficult for investigators to receive funding for scientifically meritorious proposals when insufficient funds are available and strong proposals must be set aside unfunded. The is a problem for established researchers who may have to dismantle their research teams and lose their infrastructure because of a lack of funds. It is especially damaging for young scientists who are unable to secure the funding needed to launch their careers and may have to seek other careers because they are unable to produce the body of research required to earn tenure at leading universities.

BIOGRAPHY FOR JOHN B. JEMMOTT III

John B. Jemmott III received his Ph.D. in Psychology from the Department of Psychology and Social Relations at Harvard University. From 1981 to 1999, he served as Instructor, Assistant Professor, Associate Professor, and Professor of Psychology at Princeton University. He currently holds joint faculty appointments at the University of Pennsylvania as the Kenneth B. Clark Professor of Communication in the Annenberg School for Communication and as Professor of Communication in Psychiatry in the School of Medicine. He also directs the Center for Health Behavior and Communication Research in the School of Medicine at the University of Pennsylvania.

Dr. Jemmott is a Fellow of the American Psychological Association and the Society for Behavioral Medicine. He has served as a regular member of several National Institutes of Health (NIH) panels, including the Behavioral Medicine Study Section, the AIDS and Immunology Research Review Committee, and the Office of AIDS Research Advisory Council. Dr. Jemmott has published numerous articles and has been the recipient of many grants from the National Institutes of Health to conduct research designed to develop and test theory-based, contextually appropriate HIV/STD risk reduction interventions for inner-city African American and Latino populations. He was identified in the 25 July 2008 issue of *Science* magazine as one of the 10 researchers whose work into HIV/STD risk reduction interventions received the most investigator-initiated (R01) grant funding from the NIH (fiscal year 2007).

The Centers for Disease Control and Prevention have identified as effective and have disseminated three curricula based on his HIV prevention research with adolescents: "Be Proud! Be Responsible! Empowering Adolescents to Reduce their Risk of HIV," "Making a Difference! An Abstinence Approach to HIV/STD Risk Reduction," and "Making Proud Choices! A Safer Sex Approach to HIV/STD Risk Reduction." Dr. Jemmott is currently conducting research on HIV/STD prevention strategies for couples where one partner is living with HIV, African American men who have sex with men, and adolescents and adult men in sub-Saharan Africa, where the HIV pandemic is taking its heaviest human toll.

Chairman BAIRD. Thank you.

Dr. Kenkel.

STATEMENT OF DR. DONALD S. KENKEL, PROFESSOR OF POLICY ANALYSIS AND MANAGEMENT, COLLEGE OF HUMAN ECOLOGY, CORNELL UNIVERSITY

Dr. KENKEL. Thank you for the opportunity to testify. I am convinced that the social sciences in general and economics in particular have much to offer to improve our nation's health. Nobel Prize winning economist Gary Becker has argued that, "Economic theory is not a game played by clever academicians but is a powerful tool to analyze the real world." To inform public health policy, empirical health economists like myself combine economic theory with careful analysis of data to try to quantify the impact of various real world influences on individual health behaviors.

In these comments I will try to overview some research on the economics of health behaviors and provide a few examples of their relevance for public policy and then make a few comments about the importance of NSF and NIH support for health economics.

Some health economics research focuses on the health care sector. The research I will overview uses the tools of economics to better understand the determinance of these health behaviors outside the health care sector like smoking and obesity.

The economic approach to human behavior emphasizes that people respond to incentives. Consequences for their health can provide people with very strong incentives to quit an unhealthy behavior like smoking or to start a healthy behavior like regular exercise. The history of smoking in the U.S. is a good example. Since the 1964, Surgeon General's Report on the health consequences of smoking, the prevalence of smoking among U.S. adults has dropped from over 40 percent to about 21 percent. Econometric studies suggest that improved consumer information about the risks of smoking helped lead to part of this drop. When people learned smoking was unhealthy, many people quit smoking, and others didn't start smoking in the first place.

My colleagues and I recently completed an empirical study of the impact of pharmaceutical industry advertising on smoking cessation decisions, another important source of health information. Based on our results, we estimate that if the smoking cessation product industry increased its expenditures on magazine advertising by 10 percent, the result would be about 225,000 new attempts to quit smoking each year and 8,000 successful quits each year.

This is part of a growing body of evidence that direct-to-consumer ads increased consumer demand for a variety of pharmaceutical products. Easing regulation on ads for smoking cessation products could exploit more fully the industry's profit incentives to promote public health.

More generally, when crafting public policy, it is important to keep in mind the private incentives to improve public health. People want to live healthier, longer lives, and private sector firms can make profits helping them do so. Public policies should be structured to facilitate the public health gains enjoyed when firms pursue their private profits.

The prices consumers pay for health-related goods also provides important incentives that influence health behaviors. Dozens of econometric studies estimate the price responsiveness of demand

for alcoholic beverages and cigarettes. I have contributed to both lines of research. In research funded by the National Institute on Alcohol Abuse on Alcoholism, I found evidence that even heavy drinking falls when the prices of alcoholic beverages increase.

Research funding from the National Cancer Institute helped my colleagues and I launch a series of studies on the effects of higher prices on youth smoking. The Guide Tax Policy, the NIAAA special reports to Congress on alcohol and health and the Surgeon General's reports on tobacco and health regularly review econometric studies of the price or tax responsiveness of alcohol and cigarette demand.

Health economics research takes on hard research questions about the impact of public policies on health behavior. While I believe health economics research provides useful guidance for policy, it is important to keep in mind how hard the questions are. For example, over the past few decades the Federal Government and the states have launched massive and varied public policy campaigns to reduce smoking. As various policies have been enacted, it is clear that smoking rates have fallen and public anti-smoking sentiment has grown. Yet teasing out the direction of causality and the contribution of specific policies is extremely difficult.

Social science research also contributes to public policy when it reminds us of the wisdom of the old comment, "It ain't so much the things we know that get us into trouble, it is the things we do know that just ain't so." This in turn reminds me of the almost inevitable comment at the end of an academic paper, "More research is needed." This comment is probably not what you want to hear, but it is not an admission of failure but reflects how science progresses. Answers to hard research questions are re-examined and probed, leading to new answers and better questions.

Research on the economics of health behaviors requires data on health behaviors and on the factors that influence them. Federal and State governments' data collection efforts are a very valuable resource for this research. The NIH and the NSF Foundation, the NSF, also provide important resources for health economics research supporting investigator-initiated date collection.

An applied field like health economics also relies on insights from economic theory and uses tools and methods developed in econometric theory. NSF support for even seemingly esoteric research topics in economic and econometric theory improves health economics research over time. The NIH, of course, provides support for many economics projects with more immediate significance for public health.

I believe a source of missed research opportunities is the gap between economists and some of the other social and behavioral scientists including my colleagues here, who design, implement, and evaluate public health interventions. For example, some emerging research is exploring the use of monetary incentives to reduce smoking and illicit drug use. Increasingly, behavioral economists integrate insights from psychology into standard economic models of consumer behavior. Data from intervention research could provide a rich source to testing predictions from behavioral health economics.

I will stop with my comments there. Thank you very much.

[The prepared statement of Dr. Kenkel follows:]

PREPARED STATEMENT OF DONALD S. KENKEL

Thank you for the opportunity to testify about "The Role of Social Sciences in Public Health." I am convinced that the social sciences in general, and economics in particular, have much to offer to help improve our nation's health. Nobel Prize-winning economist Gary Becker has argued that: "Economic theory is not a game played by clever academicians but is a powerful tool to analyze the real world." To inform public health policy, empirical health economists like myself combine economic theory with the careful analysis of data to try to quantify the impact of various influences on individual health behaviors.

Health economics is a relatively young sub-field of economics, and in its early days was sometimes instead called "medical economics" or "health care economics." Today, many health economists continue to focus on the financing and delivery of health care. These economists explore important questions about physician behavior, the hospital industry, and private and public health insurance, to name just a few areas of health care sector research. However, many key health behaviors are outside the health care sector. Current estimates suggest that almost half of all deaths in the U.S. can be traced to cigarette smoking, sedentary lifestyles and obesity, and alcohol consumption.[1] An exciting and productive line of research uses the tools of economics to better understand the determinants of these health behaviors. To give an idea of how productive: my colleague John Cawley and I recently co-edited a collection of the most important and interesting papers in the economics of health behaviors.[2] The collection runs to three volumes and includes 85 academic studies written by health economists from the U.S. and across the world.

Another way to view the field of health economics is that health care sector economics is mainly about "cure," while the economics of health behaviors is mainly about "prevention." There is an old saying that an ounce of prevention is worth a pound of cure. Health economists have not been able to quantify the benefits of prevention quite so precisely. In fact, investing in prevention will not necessarily reduce aggregate health care spending. But our public policy goal is not simply to contain health care costs, but to spend our health care dollars well. Preventing deaths due to smoking, obesity, and other unhealthy behaviors can help the U.S. get the most value from the societal resources we invest in health.

The economic approach to human behavior emphasizes that people respond to incentives. The consequences for their health can provide people with strong incentives to quit an unhealthy behavior like smoking or to start a healthy behavior like regular exercise. However, the health consequences only matter if people know about them. I've contributed to a line of health economics research that studies how health information shapes health behaviors. The history of smoking in the U.S. is a good example. Since the 1964 Surgeon General's Report on the health consequences of smoking, the prevalence of smoking among U.S. adults has fallen from over 40 percent to about 21 percent.[3] Econometric studies suggest that improved consumer information about the risks of smoking led to part of this drop: when they learned smoking was unhealthy, many people quit smoking, and others didn't start in the first place. These studies exploit information "shocks"—discrete events like the publication of the 1964 Surgeon General's Report that provided people with more health information. International studies suggest that similar information shocks also reduced smoking in other countries.[4] In a study I completed earlier in my career, I found that information appears to be an important incentive to adopt healthier behaviors related to smoking, drinking, and exercise.[5]

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[1] Mokdad, A.H., Marks, J.S., Stroup, D.F., and Gerberding, J.L. (2004). Actual Causes of Death in the United States: 2000. *JAMA* 291 (10): 1238–1245.

[2] Cawley, John and Donald Kenkel, co-editors (2008). *The Economics of Health Behaviours, Volumes I–III.* The International Library of Critical Writings in Economics, An Elgar Reference Collection. Edward Elgar Publishing: Northampton, MA.

[3] Rock, V.J., A. Malarcher, J.W. Kahende, et al. (2007). "Cigarette Smoking Among Adults—United States, 2006." *Morbidity and Mortality Weekly Report* 56 (44): 1157–1161.

[4] Kenkel, Donald and Likwang Chen (2000). "Consumer Information and Tobacco Use." In: Jha P and FJ Chaloupka, Editors. *Tobacco Control in Developing Countries.* Oxford University Press, pp. 177–214.

[5] Kenkel, Donald (1991). "Health Behavior, Health Knowledge, and Schooling," *Journal of Political Economy* 99 (2): 287–305.

My colleagues and I recently completed an empirical study of the impact of pharmaceutical industry advertising on smoking cessation decisions.[6] Although many smokers quit 'cold turkey' without assistance, medical research shows that smokers are more likely to successfully quit if they use a pharmaceutical smoking cessation product such as a nicotine replacement therapy. The cessation product industry's estimated retail sales are nearly $1 billion annually. In recent years the industry has spent between $100 to $200 million annually advertising these products. In other health-related markets, producer advertising has been shown to be an important source of health information that prompted people to consume more dietary fiber and less saturated fat.[7] Similarly, we find that the more magazine advertisements smokers see for products like the nicotine patch, the more likely they are to try to quit smoking and to be successful. Based on our results, we estimate that if the smoking cessation product industry increases its average annual expenditures on magazine advertising by 10 percent, the result would be about 225,000 new attempts to quit and 80,000 successful quits each year.

The prices consumers have to pay for health-related goods also provide important incentives that influence health behaviors. Dozens of econometric studies estimate the price-responsiveness of demand for alcoholic beverages and cigarettes. I've contributed to both lines of research. In research funded by the National Institute on Alcohol Abuse on Alcoholism, I found evidence that even heavy drinking falls when alcoholic beverage prices increase, although there may be a subset of very heavy drinkers who are not responsive.[8] This is consistent with other research that shows that higher prices reduce alcohol-related consequences including liver cirrhosis death rates and drunk driving. Research funding from the National Cancer Institute helped my colleagues and I launch a series of studies on the effects of higher cigarette prices on youth smoking.[9] Higher cigarette prices potentially reduce smoking through three channels: by preventing youth from starting; by encouraging smokers to quit; and by encouraging smokers to cut down their daily consumption. Our research, and research in several other countries, call into question whether higher prices are really very effective in preventing youth from starting. Although the implications of our findings are still controversial, they tend to suggest that the main effect of higher prices is through encouraging smokers to either cut down or quit.

By providing new insights about what influences health behaviors, health economics research helps shape public policies such as marketing restrictions or taxes that have broad effects on consumers and thus on public health. In contrast, other social and behavioral sciences study more targeted interventions, such as an individual-level intervention to help smokers quit, or a school-level intervention to prevent adolescents from abusing alcohol. Targeted interventions play an important role in public health and can yield highly visible success stories of individuals whose health was improved. Broad public policies can also yield important health improvements, but the success stories are found in data that might show that the population rate of smoking cessation increased over time, or that the population rate of drunk driving fell.

Health economics research on the role of health information has important implications for broad public policies. In addition to directly providing information, other policies such as marketing regulations affect the flow of health information to consumers. Our study of smoking cessation product advertising is part of a growing body of evidence that direct-to-consumer ads increase consumer demand for a variety of pharmaceutical products. The U.S. and New Zealand are the only countries that allow DTC advertising of prescription pharmaceutical products. Even in these two countries, DTC ads are strictly regulated. In the U.S. this had led to an ironic situation: in some ways, ads for prescription pharmaceutical products for smoking

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[6] Avery, Rosemary, Donald Kenkel, Dean Lillard, and Alan Mathios (2007). "Private Profits and Public Health: Does Advertising Smoking Cessation Products Encourage Smokers to Quit?" *Journal of Political Economy* 115 (3): 447–481.

[7] Ippolito, Pauline M. and Alan Mathios (1990) "Information, Advertising and Health Choices: A Study of the Cereal Market." *RAND Journal of Economics* 21 (3):459–480. Ippolito, P. and Mathios, A., (1995) "Information and Advertising: The Case of Fat Consumption in the United States," *American Economic Review: Papers and Proceedings,* 85 (2) May.

[8] Kenkel, Donald (1993). "Drinking, Driving, and Deterrence: The Effectiveness and Social Costs of Alternative Policies," *Journal of Law and Economics,* pp. 877–913. Kenkel, Donald (1996). "New Estimates of the Optimal Tax on Alcohol," *Economic Inquiry* 34: 296–319.

[9] DeCicca, Philip, Donald Kenkel, and Alan Mathios (2002). "Putting Out the Fires: Will Higher Taxes Reduce the Onset of Youth Smoking?" *Journal of Political Economy* 110 (1): 144–169. DeCicca, Phillip, Donald Kenkel, Alan Mathios, Yoon-Jeong Shin, and Jae-Young Lim (2008). "Youth Smoking, Cigarette Prices, and Anti-Smoking Sentiment." *Health Economics* 17 (6): 733–749. DeCicca, Philip, Donald Kenkel, and Alan Mathios (2008). "Cigarette Taxes and the Transition from Youth to Adult Smoking: Smoking Initiation, Cessation, and Participation." *Journal of Health Economics* 27 (4): 904–917.

cessation have been more heavily regulated than cigarette advertisements. Food and Drug Administration (FDA) regulations require prescription smoking cessation product ads in magazines to include at least an extra page of disclosures about side effects and contraindications; cigarette ads are only required to carry a short warning label. Easing regulations on ads for smoking cessation products could exploit more fully the profit incentives to promote public health. Ads for other pharmaceutical products, such as statins to treat high cholesterol, have similar potential. Because the potential gains and harms from advertising vary widely across products, it might make sense for the FDA to adopt a more flexible approach to regulate DTC advertising.

More generally, when crafting public policy it is important to keep in mind the private incentives to improve public health. People want to live healthier and longer lives, and private sector firms can earn profits helping them do so. Public policies should be structured to facilitate rather than impede the public health gains enjoyed when firms pursue private profits.

As mentioned above, many econometric studies estimate the price-responsiveness of consumer demand for alcoholic beverages and cigarettes. Because prices can be manipulated by imposing excise taxes, these estimates also have implications for public health policy. The National Institute on Alcohol Abuse and Alcoholism's Special Reports to Congress on Alcohol and Health and the Surgeon General's Reports on Tobacco and Health regularly review econometric studies of the price- or tax-responsiveness of alcohol and cigarette demand.

Health economics research takes on hard research questions about the impact of public policies on health behaviors. Typically we use observational data and try to identify natural quasi-experiments created, for example, by events or changes in policies. While I believe health economics research provides useful guidance for policy, it is important to keep these limitations in mind. For example, over the past few decades the Federal Government and the States have launched massive and varied public policy campaigns to reduce smoking. As various policies have been enacted, smoking rates have fallen and public anti-smoking sentiment has grown. Yet teasing out the direction of causality and the contribution of specific policies is extremely difficult. An example is the controversy I mentioned earlier about the price-responsiveness of youth smoking. Youth smoking rates remain higher in the tobacco-producing states, which until recent years have rarely increased cigarette taxes. Are youth smoking rates high in these states because cigarette taxes are low? Or are cigarette taxes low because smoking is part of the culture in these states?

Social science research also contributes to public policy when it reminds us of the wisdom of the comment: "It ain't so much the things we don't know that get us into trouble, it's the things we do know that just ain't so."[10] This in turn reminds me of the almost inevitable comment at the end of academic papers: "More research is needed." This academic comment is not an admission of failure, but reflects how science progresses. Answers to hard research questions are re-examined and probed, leading to new questions and better answers.

Because it is still a young field, it is not surprising that basic research questions on the economics of health behaviors remain unanswered. Recently, some of the questions receiving the most attention concern health disparities related to socioeconomic status. Again, smoking provides a stark example—it is increasingly true that smokers are more likely to have lower incomes and less schooling. For example, in 2006 about 35 percent of high school dropouts smoked, compared to only about 10 percent of college graduates and less than seven percent of those with graduate degrees. Why is this the case? One hypothesis is that people with more schooling are better able to gather and process information about the health risks of smoking. This explanation is supported by the fact that in the 1950s—before medical research firmly established the health risks of smoking—college graduates were about as likely to smoke as those with less schooling. But this explanation is hard to reconcile with the persistence of the schooling gap in smoking 50 years later, when virtually everyone understands that smoking kills. Health economists are exploring other explanations, such as the idea that there are other hard-to-observe differences between people with different levels of schooling.

Understanding the schooling-smoking link might provide a case study for understanding the links between schooling and health more generally. If schooling helps people make healthier choices, investments in schooling could also pay off in the form of reductions in obesity or other health problems. If other hard-to-observe factors are the root causes of both low schooling attainment and unhealthy choices, investments in more schooling may not be enough.

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[10] Attributed to Artemus Ward, American humorist, 1834–1867.

Research on the economics of health behaviors requires data on health behaviors and on the factors that influence them. Federal and State governments' data collection efforts are a very valuable resource for this research, including the National Health Interview Survey, the Behavioral Risk Factor Surveillance Surveys, the Youth Risk Behavior Surveillance System, and the Tobacco Use Supplements to the Current Population Survey. Federal support for ongoing longitudinal studies—including the Panel Study of Income Dynamics, the Health and Retirement Survey, the National Longitudinal Surveys of Youth, and the National Longitudinal Study of Adolescent Health—provides especially useful data to follow individual health behaviors over time. Health economists often use data from ongoing collections to study health behaviors before and after a natural quasi-experiment in policy or circumstances. Innovations in data collection, such as the collecting biomarkers, present opportunities to move health economic research in exciting new directions.

The National Institutes of Health and the National Science Foundation also provide important resources for health economics research through supporting investigator-initiated data collection. The National Institute of Health's data sharing policy "expects and supports the timely release and sharing of final research data from NIH-supported studies for use by other researchers." Data sharing is essential for the scientific process. With data sharing, NIH and NSF support help not only the funded investigators, but can also prompt other researchers to replicate and extend the original data analysis, and to use the data in new ways to ask different questions.

An applied field like health economics relies on insights from economic theory and uses tools and methods developed in econometric theory. NSF support for even seemingly esoteric research topics in economic and econometric theory improves health economics research over time. The NIH provides support for many economics projects with more immediate significance for public health. Unfortunately, sometimes important research falls in between the cracks. For example, developing new econometric methods for the analysis of data on health behaviors might seem "too applied" to NSF reviewers but at the same time seem "too theoretical" to NIH reviewers. Educating NSF and NIH reviewers about each other's missions could help better integrate federal funding for health economics research.

Another source of missed research opportunities is the gap between economists and the social and behavioral scientists who design, implement, and evaluate public health interventions. It is increasingly common for health economists to be involved near the end of these research projects, when they conduct cost-effectiveness analyses of the interventions. This is an encouraging trend, and the results of cost-effectiveness analyses help to maximize the health benefits from limited budgets for interventions. As social scientists, however, economists could also be usefully involved earlier in the research design. For example, some emerging research is exploring the use of monetary incentives to reduce smoking and illicit drug use. Behavioral economists integrate insights from psychology into standard economic models of consumer behavior. Data from intervention research could provide a rich source to testing predictions from behavioral health economics.

BIOGRAPHY FOR DONALD S. KENKEL

Donald S. Kenkel is a Professor in the Department of Policy Analysis and Management at Cornell University, and a Research Associate of the National Bureau of Economic Research. His expertise is in areas of health economics and public sector economics. Broadly speaking, most of his research is on the economics of disease prevention and health promotion. He is the author of the chapter on "Prevention" in the *Handbook of Health Economics.* He has conducted a series of studies on the economics of public health policies, including: alcohol taxes and other policies to prevent alcohol problems (*Journal of Applied Econometrics* 2001, *American Economic Review Papers & Proceedings* 2005); cigarette taxes to prevent youth smoking (Journal of Political Economy 2002); and advertising to promote smoking cessation (*Journal of Regulatory Economics* 2007 and *Journal of Political Economy* 2007). Another area of research and teaching interest is in cost-benefit analysis of public policies, especially policies that affect health. His research has been funded by the National Institute on Alcohol Abuse and Alcoholism, the National Cancer Institute, the National Institute on Child Health and Development, as well as private foundations.

Chairman BAIRD. Thank you.

Dr. Koenig.

STATEMENT OF DR. HAROLD G. KOENIG, PROFESSOR OF PSYCHIATRY AND BEHAVIORAL SCIENCES; ASSOCIATE PROFESSOR OF MEDICINE; DIRECTOR OF THE CENTER FOR THEOLOGY, SPIRITUALITY, AND HEALTH, DUKE UNIVERSITY

Dr. KOENIG. Thank you, Mr. Baird.

I am going to speak on religion, spirituality, and public health. In overviewing this topic I would like to say that the United States is a very religious and spiritual nation. Stress and depression are common and increasing in our country. Stress affects physical health and need for health services. Many turn to religion when stressed, facing sickness, or disability. Religion and spirituality may reduce stress, reduce depression, enhance quality of life, may be related to less alcohol and drug abuse, less crime, delinquency, related to better health behaviors, healthier lifestyles, better physical health, faster recovery, and less need for health services. May also enhance the community's resiliency after disaster or terrorism.

Implications for public health and patient care, I will make some of those and make some recommendations as well. Ninety-three percent of Americans believe in God or a higher power. Eighty-nine percent report a religious affiliation. Eighty-three percent say it is—that religion is very, is fairly or very important to them. About two-thirds of Americans are members of a church or synagogue or mosque. Fifty-eight percent pray every day, and 75 percent pray at least weekly. Nearly half of the country attends church at least monthly, and 42 percent weekly.

We know that there is increased stress due to the recent economic downturn. We know that depression is increasing due to loss of jobs and homes. We know that debt is increasing, and people are not saving. We know that youth are facing many, many choices with very few absolute guides by which to guide their behavior and their choices. The population is aging, facing increasing health problems, fewer saving for retirement, and that is creating fear.

We know that stress and depression affect physical health and use of health services, that diseases like heart attacks, hypertension, stroke, infection, wound healing, the aging process itself appears to be affected by stress and depression, and all of that increases hospital stays and need for health services.

Many in the U.S. turn to religion to cope with stress and illness. After September 11, 90 percent of Americans turned to religion. That was reported in the New England Journal of Medicine. Ninety percent of hospitalized patients rely on religion to cope, and nearly half in some areas of the country say that it is the most important factor that keeps them going. Hundreds of quantitative and qualitative studies report similar findings.

Research on religion, spirituality and health is increasing dramatically. Prior to the year 2000, if you did an online search, you would find that there were about 6,282 scientific articles on the topic. In the last seven to eight years that has increased to over 7,000 articles. Just in the last seven to eight years those are the number of articles. About 20 percent of those are original research studies. So to date there are nearly 3,000 studies looking at these relationships. More research has been conducted recently than in a long time previous to the year 2000.

Now, religious involvement can buffer stress, reduce depression, enhance quality of life. Of 324 studies looking at depression, 204 find significantly less depression or faster recovery from depression in those who are more religious. Of 359 studies looking at well-being, happiness, meaning, purpose, hope, 278 show significantly more positive emotions in the religious. With regard to increased quality of life, 20 of 29 recent studies showing that.

Here is just an example of some of the research showing that religious involvement affects the recovery rates for depression over time when you follow people.

Religion is also related to less drug and alcohol use, especially among the young. Of 324 studies, 276 show significantly lower rates, less delinquency and crime found in 40 of 52 studies. These are all peer review studies quantitative, original research published in science journals.

Religion is related to less cigarette smoking, especially among the young. Fifty of 58 studies show that. Religious persons are also more likely to exercise. Unfortunately, it is not related to diet and weight. So whatever reason that is, but also religion is related to less extra-marital sex and safer sexual practices with regard to fewer partners. So 45 of 46 studies show those relationships.

Here is a slide I don't show in North Carolina, but I will show it here. Religious attendance and cigarette smoking. Clearly people attending services more aren't as likely to smoke. Religion is related to better physical health and recovery from illness. Here is a list of the different diseases which are less frequent among those who are more religious. This is just an example of survival after open heart surgery. This is out of Dartmouth. You can see that those with high religious support and high social support have much lower rates of death during the six months after surgery.

This is a national sample of twenty thousand people looking at life expectancy. Among whites the length of survival is seven years longer among those attending services compared to those who aren't. Among African-Americans it extends to 14 years longer. Religious persons need and use less health care services as well. Because there is greater marital stability, there is more social support, they are healthier, and that translates into shorter hospital stays, fewer hospital days, and less time spent in nursing homes because people are kept in the community longer.

Here is an example just of the length of hospital stay at Duke Hospital based on religious affiliation alone. Here is looking at days spent in long-term care after hospital discharge. In African-Americans that means fifty days in the 10-month period following discharge compared to five days.

Religion enhances community resiliency to disaster and terrorism, helps people to cope with stress from an individual level, helps long-term adaptation. At the community level religious organizations are present in every community. Clergy are oftentimes the first responders. Religious communities are often present over the long-term after many other agencies leave, and many national religious organizations are active in disaster response.

So what? So what? You can't convert everybody or make them religious, but there are numerous direct public health and patient care implications which have nothing to do with prescribing reli-

gion, endorsing religion, or overstepping the bounds of church-state separation guaranteed by the First Amendment.

Here are some implications for public health. More research is needed, we don't understand the mechanisms. Even small health effects are likely to lead to big, public health impact, given that there are 200 million church members, 125 million weekly attenders.

While not ethical or desirable to change a person's religion or spirituality, we need to know this information for planning health services. They also discover information that are useful for enhancing health interventions in non-religious people, using secular interventions. Congregations are one of the few places where persons of all ages and races, and economic levels meet regularly. You can do screening there, and health education. Ideal place to educate youth with regard to substance abuse; stress reduction and healthy lifestyle education for the middle-aged; and training for volunteering and mentorship for the elderly. Altruism is a basic value for churches, and here is potential volunteers to support programs in the community during disasters and non-disaster periods.

Many implications for patient health. Religion may help patients to cope with illness, may affect their health outcomes. Many patients want their religion acknowledged, patients have spiritual needs, and patients are often isolated from sources of religious help. Religious beliefs influence medical decision-making and compliance with treatment. Religious communities support patients in the community. We want health care professionals to take a brief spiritual history, support the patient's beliefs and practices, identify their spiritual needs, and refer them to appropriate people.

Chairman BAIRD. Dr. Koenig, I am going to ask you to conclude at this point, because we are about four minutes over. We will get to some of these issues in a second. If you one or two final comments but——

Dr. KOENIG. Okay. There are many recommendations as you can see for Congress here in terms of research, in terms of supporting congregational health programs, in terms of educating the public, and in terms of integrating faith-based organizations in disaster response.

Thank you very much.

[The prepared statement of Dr. Koenig follows:]

PREPARED STATEMENT OF HAROLD G. KOENIG

Religion, Spirituality and Public Health: Research, Applications, and Recommendations

Summary

This report reviews *original* research published in social, psychological, behavioral, nursing and medical journals since the 1800s that has examined relationships between religion/spirituality (R/S) and the health of individuals and populations. I describe (1) the prevalence of religious beliefs and practices in United States; (2) the increasing stress in America and negative effects on physical health; (3) the role R/S play in coping with stress and physical illness; (4) the relationships between religious involvement, stress, and depression; (5) the relationships between religion, substance abuse, and health behaviors; (6) the relationships between religion and physical health; (7) the impact on need for medical care and use of health services; and (8) the effects on community resiliency following natural disasters and acts of terrorism. This review suggests that as many as 3,000 quantitative studies have

now examined relationships between R/S and health (mental and physical), the majority reporting positive findings. I examine the implications this research has for public health and patient care, and make recommendations that could lead to a better understanding of these relationships and to applications that may improve public health, promote community resiliency, enhance patient care, and lighten the ever-increasing economic burden of providing health care and protecting our population.

Introduction

Until recently, scientists have largely avoided studying the relationship between religion and health. A young faculty member wishing to examine these relationships was often told that conducting such research amounted to an "anti-tenure" factor. Furthermore, there was little if any funding from NSF/NIH to support such research. Religious beliefs and behaviors were largely thought of as too subjective, not quantifiable, unscientific, and based in fantasy and infantile projections or illusion (Freud). As a result, health professionals today ignore their patients' religious or spiritual needs, and have little appreciation for their relationship to health.

Times are changing. There has been a tremendous surge in research examining relationships between religion, spirituality, and health (95 percent conducted without funding). Research on this subject carried out prior to the year 2000 has been systematically reviewed in the *Handbook of Religion and Health* (Oxford University Press, 2001). That review uncovered over 1200 studies published in a wide array for psychological, behavioral, medical, nursing, sociological, and public health journals. During the time since publication of this book, the amount of research on the subject has increased dramatically. An online search using the keywords "spirituality" and "religion" between 2000 and 2008 in *PsychInfo* (the American Psychological Association's online database of research in the psychological, social, and behavioral sciences) recently uncovered 7,145 scientific articles (about 20 percent reporting original research). Repeating the same search but restricting the years to 1806 to 1999, uncovered 6,282 articles. Thus, more research on religion, spirituality and health has been published in the past seven to eight years than was published in the nearly 200 years before that. Covering this massive research base, then, is a daunting task.

The present report reviews *original* research conducted in the social, psychological, behavioral, and medical sciences that has examined relationships between religion/spirituality (R/S), and health. Where individual studies are cited, these represent some of the best work on the topic in terms of research design. They often utilize large representative population-based or clinical samples, control for relevant confounders, and employ distinctive, uncontaminated measures of religion/spirituality (R/S). Most studies are observational in research design, although a small number of clinical trials are included. Some aspects of this review are systematic (for example, studies on depression, positive emotions, substance abuse, delinquency, health behaviors), while others are not. For example, studies reported on physical health outcomes have been chosen to illustrate the kinds of studies published, but the review is not systematic. A complete systematic review of this area is now underway (*Handbook of Religion and Health,* 2nd edition, Oxford University Press, 2011).

Below I examine (1) the prevalence of religious beliefs and practices in the United States; (2) the increasing stress in our population and the negative effects of stress/depression on physical health; (3) the role that R/S plays in coping with stress and physical illness; (4) the relationships between religious involvement, stress, and depression; (5) the relationships between religion, substance abuse, and health behaviors; (6) the relationships between religious involvement and physical health; (7) the impact on need for medical care and use of health services; and (8) the effects that religious involvement has on community resiliency following natural disasters and acts of terrorism. Next, I examine the implications of this research for public health and clinical practice. Finally, I make a series of recommendations for Members of Congress to consider.

Facts to Ponder

• *The United States is a very religious nation:*

Fact #1: **93 percent of Americans believe in God** or a higher power, according to a Gallup Poll conducted in May 2008, (see website: *http://www.gallup.com/poll/109108/Belief-God-Far-Lower-Western-US.aspx*).

Fact #2: **89 percent of Americans report affiliation with a religious organization** (82 percent Christian, i.e., Protestant or Catholic), according to a representa-

tive national survey conducted by Baylor Institute for Studies of Religion in September 2006 (see website: *http://www.baylor.edu/content/services/document.php/33304.pdf*). Same figures reported by Gallup Poll in December 2007 (see website: *http://www.gallup.com/poll/103459/Questions-Answers-About-Americans-Religion.aspx*)

Fact #3: **83 percent of Americans say religion is fairly or very important** to them, according to a September 2006 Gallup Poll (latest data available) (see website: *http://www.gallup.com/poll/25585/Religion-Most-Important-Blacks-Women-Older-Americans.aspx*)

Fact #4: **62 percent of Americans say that they are members of a church or synagogue,** according to a December 2007 Gallup Poll (latest data available) (see website: *http://www.gallup.com/poll/103459/Questions-Answers-About-Americans-Religion.aspx*)

Fact #5: **58 percent of Americans pray every day** (and 75 percent at least weekly), according to a 2008 U.S. Religious Landscape Survey (see website: *http://religions.pewforum.org/*)

Fact #6: **42 percent of Americans attend religious services weekly or almost weekly** (and 55 percent attend at least monthly), according to aggregate Gallup Pools in 2007 (see website: *http://www.gallup.com/poll/105544/Easter-Season-Finds-Religious-Largely-Christian-Nation.aspx*).

- *Stress and depression are common in American society, especially due to the recent economic downturn. Both stress and depression worsen when people develop medical illness and health problems.*

Fact #1: **Stress levels, and likely stress-related disorders, are increasing** in the United States, based on Associated Press-AOL poll (see website: *http://www.aolhealth.com/healthy-living/debt-stress*; also see: *http://www.usatoday.com/news/health/2007-10-23-stress_N.htm*)

Fact #2: **Rates of significant depression in the community are about five to ten percent, and place a substantial burden on the economy** due to cost of treating depression and time lost from work due to depression-related disability (*Journal of the American Medical Association* 2002, 287:203–209; *Journal of Clinical Psychiatry* 2003m 64:1465–1475; *PharmacoEconomics* 2007, 25:7–24)

Fact #3: **Nearly 50 percent of hospitalized medical patients develop depressive disorder,** usually due to the prolonged stress and life changes caused by medical problems (*American Journal of Psychiatry* 1997; 154:1376–1383)

- *Stress and depression have effects on physical health and need for health services*

Fact #1: **Psychological stress and depression adversely affect health.** This applies to a wide range of medical outcomes (hypertension, myocardial infarction, stroke, speed of wound healing, etc.), and may even affect the aging process itself (based on changes at the DNA level) (*Lancet* 1996, 346:1194–1196 (wound healing); *New England Journal of Medicine* 1998, 338:171–179 (general review); *Lancet* 2003, 362:604–609 (prognosis after myocardial infarction); *Proceedings of the National Academy of Sciences* 2004,101:17312–5 (cellular aging))

Fact #2: **Depression increases length of hospital stay and cost of medical services,** in addition to adversely affecting the quality of life of the patient and their family (*American Journal of Psychiatry* 1998, 55:871–877; *Social Psychiatry and Psychiatric Epidemiology* 2004, 39:293–298; for more recent information, see the following NIH report: *http://www.nih.gov/news/pr/jan2007/nimh-19.htm*)

- *Many in the United States turn to religion for comfort when stressed or sick.*

Fact #1: **Religion is often used to cope with stress.** Following the terrorist attacks on September 11, 2001, research shows that nine out of ten Americans turned to religion to cope (*New England Journal of Medicine* 2001, 345:1507–1512)

Fact #2: **Religion is often used to cope with mental/physical health problems.** Research shows that in some areas of the United States, nine out of ten hospitalized patients say they use religion to cope with illness, and over 40 percent say that it is the most important factor that keeps them going. (*Handbook of Religion and Health,* 2001; Oxford University Press). Since the year 2000, over 130 separate quantitative studies have documented high rates of religious coping in a range of health conditions, especially in minority groups and in women. This number does not include hundreds of peer-reviewed published qualitative studies (in the words of patients) that support these findings.

• *Religious involvement may help to reduce stress, minimize depression, and enhance quality of life.*

Fact #1: Because of its effectiveness as a coping behavior, religious involvement may **reduce psychological stress, buffer against depression, and speed recovery from emotional disorders** (*American Journal of Psychiatry* 1992, 149:1693–1700; *American Journal of Psychiatry* 1998, 155:536–542; *Journal of Nervous and Mental Disease* 2007, 195:389–395).

Of studies examining religion and depression prior to the year 2000, 64 of 101 studies (64 percent) reported less depression or faster recovery from depression among the more religious (*Handbook of Religion and Health,* ibid). Since the year 2000 (past seven to eight years), 140 of 223 studies (63 percent) reported less depression or faster recovery from depression in the more religious (unpublished review).

Fact #2: Religious involvement is associated with positive emotions (greater well-being, happiness, optimism, hope, meaning and purpose in life) and higher quality of life.

Well-being: Of research conducted prior to the year 2000, 106 of 131 studies (81 percent) reported that religious persons experienced more positive emotions (*Handbook of Religion and Health,* ibid). Since the year 2000 (past seven to eight years), 172 of 228 studies (75 percent) have reported this same finding (unpublished review). **Quality of Life:** Since the year 2000, 20 of 29 studies on R/S and quality of life reported that they were positively associated.

• *Religious involvement is related to lower rates of alcohol and drug abuse, less crime and delinquency, and better grades in school.*

Fact #1: Religious involvement predicts **lower rates of alcohol and drug use,** particularly in high school students, college students, and young adults (*Prevention Science* 2001, 2(1):29–43; *Social Science Research* 2003, 32:633–658; *Psychology of Addictive Behaviors* 2003, 17:24–31; *Social Science & Medicine* 2003, 57:2049–2054; *Journal of Adolescent Health* 2006, 39:374–380; *Journal of Adolescent Health* 2007, 40:448–455; *Alcoholism: Clinical and Experimental Research* 2008, 32:723–737).

Concerning research published prior to the year 2000, 124 of 138 studies (90 percent) reported less alcohol and drug use/abuse in those who were more religious (*Handbook of Religion and Health,* ibid). Since the year 2000 (past seven to eight years), an *incomplete review* indicates that 152 of 186 studies (82 percent) reported this same finding (unpublished review). Thus, 276 of 324 studies report significant inverse relationships between religious involvement and substance abuse.

Fact #2: **Delinquency rates and crime are less frequent** in those who are more religious (*Journal of Adolescent Research* 1989; 4:125–139; *Sociology of Religion* 1996; 57:163–173; *Social Forces* 2004; 82:1553–1572; *Journal of Family Issues* 2008; 29:780–805).

Prior to the year 2000, 28 of 36 studies (78 percent) reported that delinquency or crime rates were lower among the more religious (*Handbook of Religion and Health,* ibid). Since the year 2000 (past eight years), an *incomplete review* indicates that 12 of 16 studies (75 percent) report similar findings.

• *Religious involvement is related to healthier lifestyles and fewer risky behaviors that could adversely affect health*

Fact #1: Religious involvement is associated with better health behaviors, including **less cigarette smoking and more exercise** (Cigarette smoking: *Journal of Gerontology, Medical Sciences* 1998, 53:M426–434; *Prevention Science* 2001, 2:29–43; *Social Science & Medicine* 2003, 57:2049–2054; *Families in Society* 2004, 85:495–510; *Nicotine & Tobacco Research* 2006, 8:123–133; *Journal of Adolescent Health* 2007, 40:506–513; Exercise: *American Journal of Public Health* 1997, 87:957–961; *Activities, Adaptation & Aging* 2002, 26:17–26; *Family & Community Health* 2006, 29:103–117)

Smoking: Prior to the year 2000, 22 of 25 studies (88 percent) indicated that religious persons are less likely to smoke cigarettes (*Handbook of Religion and Health,* ibid). Since the year 2000, an *incomplete review* indicates that 28 of 33 studies (85 percent) reported this finding. **Exercise:** Four of six studies have reported that religious persons are more likely to exercise. **Weight,** however, is another issue; only one of eight studies show that religious persons weigh less than those who are less religious (probably because of those potluck suppers!).

Fact #2: Religious involvement is related to **less extra-marital sex and safer sexual practices** (fewer partners) (*Social Psychology Quarterly* 1985; 48:381–387; *American Journal of Public Health* 1992; 82:1388–1394; *Journal of the American*

Medical Association 1997, 278:823–832; *Social Science & Medicine* 2003, 57:2049–2054; *American Journal of Community Psychology* 2004, 33(3–4):151–161; *Pediatrics* 2006, 118:189–200).

Prior to the year 2000, 37 of 38 studies reported this finding. Since 2000, an *incomplete review* indicates that eight of eight studies (100 percent) report this.

Fact #3: Religious involvement is related to a **lower risk, healthier lifestyle, particularly among youth.** This includes greater likelihood of wearing seat belts, better sleep quality, regular vitamin use, regular physical and dental visits, etc. (*Psychological Reports* 1991; 68:819–826; *Health Education and Behavior* 1998; 25:721–741; *European Journal of Pediatrics* 2005; 164:371–376; *Preventive Medicine* 2006; 42:309–312; *Journal of the National Medical Association* 2006, 98:1335–1341).

• *Religion is related to better physical health and faster recovery*

Fact #1: Religious involvement is associated with less cardiovascular disease, improved outcomes following cardiac surgery, lower rates of stroke, less cardiovascular reactivity and lower blood pressure, better immune/endocrine functioning, improved outcomes for patients with HIV/AIDS, lower risk of developing or better outcomes from cancer, and less susceptibility to infection:

Coronary artery disease: *International Journal of Cardiology* 1986, 10:33–41; *Cardiology* 1993, 82:100–121; *American Journal of Cardiology* 1996, 77:867–870; *Journal of Clinical Epidemiology* 1997, 50:203–209.

Cardiac surgery: *Psychosomatic Medicine* 1995, 57:5–15; *Health Psychology* 2004, 23:227–238.

Cardiovascular reactivity: *International Journal of Neuroscience* 1997, 89:15–28; *Annals of Behavioral Medicine* 2004, 28:171–178; *Journal of Health Psychology* 2005; 10:753–766.

Blood pressure: *Hypertension* 1988; 12:457–461; *Hypertension* 1995; 26:820–829; *International Journal of Psychiatry in Medicine* 1998, 28:189–213; *Behavioral Medicine* 1998, 24:122–130; *Psychosomatic Medicine* 2001, 63:523–530; *Journal of Gerontology* 2002, 57B: S96–S107; *Journal of Biosocial Science* 2003, 35:463–472; *Psychosomatic Medicine* 2006, 68:382–385.

Stroke: *American Journal of Epidemiology* 1992, 136:884–894; *Stroke* 2000, 31:568–573.

Metabolic problems: *Diabetes Care* 2002, 25(7):1172–1176; *Archives of Internal Medicine* 2006, 166:1218–1224; *Psychosomatic Medicine* 2007, 69:464–472.

Immune/endocrine: *Psychology and Health* 1988, 2:31–52; *International Journal of Psychiatry in Medicine* 1997, 27:233–250; *Journal of Psychosomatic Research* 1999, 46:165–176; *Breast Journal* 2001, 7:345–353; *Annals of Behavioral Medicine* 2002; 24:34–48; *Journal of Biological Regulators & Homeostatic Agents* 2003, 17:322–326; *Health Psychology* 2004, 23:465–475; *International Journal of Psychiatry in Medicine* 2004, 34:61–77; *Journal of General Internal Medicine* 2006, 21:S62–68; *Journal of Psychosomatic Research* 2006, 61:51–58.

Cancer: *Journal of the National Cancer Institute* 1989, 31:1807–1814 (misc. cancers); *Journal of the Royal Society of Medicine* 1993, 86:645–647 (colorectal); *Social Indicators Research* 1996, 38:193–211 (misc. cancers); *International Journal of Psychiatry in Medicine* 2002, 32:69–89 (gastrointestinal); *International Journal of Psychiatry in Medicine* 2003, 33:357–376 (breast); *American Journal of Epidemiology* 2003; 158:1097–1107 (colon); *Oral Oncology* 2006, 42:893–906 (oral).

Infection susceptibility: *British Medical Journal* 2006, 332(7539):445–450.

For reviews of the research before 2000, see *Handbook of Religion and Health,* ibid. For a more recent review, see *Medicine, Religion and Health* (2008, Templeton Press). For a critique of this research, see *Lancet* 1999, 353(9153):664–667, and *Blind Faith* (2006, St. Martin's Press).

Fact #2: Religious involvement predicts **greater longevity** and lower mortality, with religious attendance being the strongest predictor (and associated with seven to fourteen years of additional life) (*American Journal of Public Health* 1996, 86:341–346; *American Journal of Public Health* 1997, 87:957–961; *Demography* 1999; 36:273–285; *Journal of Gerontology, Medical Sciences* 1999, 54:M370–M37; *Journal of Gerontology, Medical Sciences* 2000, 55:M400–405; *Archives of Internal Medicine* 2001, 161:1881–1885; *Annals of Behavioral Medicine* 2001, 23:68–74; *Research on Aging* 2002; 22:630–667; *American Journal of Epidemiology* 2002, 155:700–709; *Journal of Health and Social Behavior* 2004, 45:198–213; *Annals of Epidemiology* 2005, 15:804–810; *International Journal of Epidemiology* 2005, 34:443–451; *Journal of Clinical Epidemiology* 2005, 58:83–91; *Journal of Gerontology* 2005, 60:S102–S109; *Journals of Gerontology* 2006, 61:S140–S146).

Fact #3: Religious activity predicts **slower progression of cognitive impairment** with aging, and may be associated with a slower progression of Alzheimer's disease (*Journal of Gerontology* 2003, 58B:S21–S29; *Journal of Gerontology* 2006, 61:P3–P9; *Neurology* 2007, 68:1509–1514 (Alzheimer's); *Journal of Gerontology, Medical Sciences* 2008, 63:480–486)

Fact #4: Religious involvement predicts **less functional disability** with increasing age, and faster functional recovery following surgery (*American Journal of Psychiatry* 1990, 147:758–759; *Journal of Gerontology* 1997, 52B:S306–S316; *Journal of Aging and Health* 2004, 16:355–374; *Research on Aging 2008,* 30:279–298).

- *All things being equal, religious people need and use fewer health care services; this is because they are healthier, more likely to have intact families to care for them, and have greater social support*

Fact #1: Religious involvement is related to greater marital stability and social support, particularly in minority communities. This affects the kind of support and monitoring a person with chronic illness will have in the community (which may keep them out of the hospital or out of a nursing home). **Marital stability:** Journal of Health and Social Behavior 1989, 30:92–104; *Behavior Genetics* 1992, 22:43–62; *Journal for the Scientific Study of Religion* 1997, 36:382–392; *Addiction* 2007, 102:786–794. **Enhanced family relationships:** *Sociological Quarterly* 2006; 47:175–194. **Social support:** *Research on Aging* 1991, 13:144–170; *Journal of Gerontology* 1997, 52B:300–305; *American Journal of Geriatric Psychiatry* 1997, 5:131–143; *Health Care for Women International* 2001, 22:207–227; *Journal of Palliative Medicine* 2006, 9:646–657; *Journal of Health Psychology* 2007, 12:580–596). Prior to the year 2000, 19 of 20 studies found that religious persons had significantly more social support.

Fact #2: Religious involvement is associated with **lower rates of health services use** (medical), both acute hospitalization and long-term care (*Social Science & Medicine* 1988, 27:1369–1379; *Southern Medical Journal* 1998, 91:925–932; *International Journal of Psychiatry in Medicine* 2002, 32:179–199; *Archives of Internal Medicine* 2004, 164:1579–1585).

- *Communities with high percentage of religious involvement recover more quickly from natural disasters and acts of terrorism*

Fact #1: After the police, firefighters, and emergency medical technicians, religious communities are often the first responders and often the most enduring responders following disasters. The extensive literature (both research studies and popular articles) documenting this fact is described in two books, *In the Wake of Disaster: Religious Responses to Terrorism and Catastrophe* (Templeton Press, 2006), and *Tend My Flock: Emergency Planning for Faith Communities* (forthcoming, 2009).

Fact #2: Religious involvement is related to better mental health, greater community resilience, and higher social capital following disasters (*Journal of Community Psychology* 2000, 28:169–186; *Annals of the New York Academy of Sciences* 2006, 1094:303–307; *Journal of Health Care for the Poor & Underserved* 2007, 18:341–354; *Social Science & Medicine* 2008, 66:994–1007).

Implications for Public Health and Patient Care

So what? Should we try to make people more religious? There are numerous direct public health and clinical applications for all of the above that have nothing to do with prescribing religion, endorsing religion, or over-stepping the bounds of church-state separation that the 1st Amendment guarantees. I divide the implications of this research into two categories: implications for public health and implications for clinical care.

Implications for Public Health

(1) More research is needed. Although there is every reason based on existing research to suggest that religious involvement is related to better health, we don't really understand why this is the case. Religion can certainly have negative health effects as well, but certain aspects of religion (cognitive, behavioral, or social) appear have positive effects on health and well-being. Is this not relevant to the health of our population and resiliency of our communities? The problem is that we don't know what aspects of religion are particularly healthy, or how these health benefits occur in terms of behavioral and physiological mechanisms. We also don't fully know how religion impacts the health of communities, or their resiliency to crime, poverty, teenage pregnancy, school performance, venereal disease transmission, natural disasters, etc. Given the widespread prevalence of religious beliefs and activities (with

nearly 200 million church members, and over 125 million weekly church attendees), even small effects on either individual or community health could have enormous public health impact.

(2) Although it is not ethical or desirable to change or increase religious involvement for health reasons, it is important for social and behavioral scientists to learn how R/S is affecting health and then inform the public about this. People, then, will need to make their own choices in this regard, free from coercion or manipulation. Furthermore, doesn't the majority of the U.S. population for whom religion is important deserve to know what effect their religious beliefs and practices are having on their health? This is particularly true since certain religious practices in some settings may actually worsen health (about five to ten percent of studies find negative correlations between religion and health). For religious beliefs, practices, and rituals that are shown to improve health, knowing this may help to boost the health effects that these beliefs/practices have for religious people (since it may encourage them to continue these practices, or may help them to utilize their beliefs to help them change unhealthy lifestyles). Thus, education of the public and dissemination of research findings about factors that may affect health is an important role for both health professionals, as well as for government agencies interested in maintaining and enhancing the health of the population.

(3) There are many human characteristics that we study in the social and behavioral sciences that we cannot change, but need to understand what impact they are having on health for planning purposes (i.e., anticipating health care needs of the population). These include age, gender, race, ethnic background, sexual preference, political belief, etc. There are also characteristics that we may be difficult to change, and yet we need to know how these factors affect health and use of health services. These include the effects of poverty, personality, level of social involvement, health habits, obesity, and so forth. This doesn't prevent us from conducting research to better understand how these factors affect health. For some reason, however, religion seems to be placed in a different and separate category. Currently, there is widespread bias in the mainstream scientific community against research on the health effects of traditional religious beliefs and practices [just take a look at the portfolio of NSF/NIH grants and see how many grants in the psychological, social, and behavioral sciences are focused this area of research].

(4) What about one-third of the U.S. population who are not religious? It may be that they too will benefit from research on religion, spirituality and health. By learning about how R/S affects health, we can apply this knowledge to non-religious settings and to non-religious people using secular techniques. For example, how does religious involvement convey meaning and purpose, hope, self-esteem, protection from depression, and buffer against stress (and perhaps consequently reduce blood pressure, heart attacks, and stroke, or slow the development of cognitive impairment and disability with age)? If we know the mechanisms, we could use them to enhance the way secular beliefs and behaviors provide these healthy effects. This would benefit everyone.

(5) There is even some research that suggests that communities where high proportions of the population are members of religious groups have better health in general, even the non-religious people who live in those communities (see *Annals of Epidemiology* 2005, 15(10):804–810; *American Journal of Sociology* 2005, 111:797–823). Shouldn't public health experts be interested in why and how this occurs? Would such research not provide clues on how to enhance the health of entire populations?

(6) There are few places where people of all ages (young, middle-aged, and elderly), all socioeconomic levels, and all ethnic backgrounds congregate on a regular basis as happens in religious communities. This makes religious organizations an ideal route by which to provide health screening, health education, and other disease detection and prevention services. A few studies have shown that health education programs in churches can affect diet, weight, exercise, and other health behaviors, and this is particularly true for minority communities who often do not have easy access to such information or to preventative health care services. Religious communities may also be an ideal place to provide alcohol and drug education, as well as inculcate moral values and character that could affect future decisions that impact health, pro-social behaviors, and even affect the ability to afford health insurance during adulthood. More research is needed and effective programs developed. Again, such efforts could have a direct impact on public and community health.

(7) Religious communities often have altruism as one of their basic values. Thus, members of churches, synagogues and mosques represent an army of potential volunteers to assist with social programs, mentoring, and direct service provision. This is perhaps most evident with regard to disaster preparation and response. Why are

we not supporting and nourishing this role that many faith communities are already engaged in? Instead, faith groups often meet resistance from formal emergency management services when they try to help, since they are not integrated into these efforts. Without the volunteer help that faith communities provide, it is not hard to imagine what the additional cost to FEMA might be. The health of our communities, particularly when affected by natural disasters or acts of terrorism, may depend on whether religious communities are fully prepared and involved in response efforts.

Implications for Patient Care

(1) If future research confirms that religious involvement significantly affects mental and physical health, then health professionals need to be educated about this and need to consider this in their treatment of patients. In fact, one could argue that there is already sufficient research evidence to begin to do this. Furthermore, there are other reasons why health professionals should be integrating spirituality into patient care. Here are a few (see *Spirituality in Patient Care,* 2007, for a complete description):

- Many patients are religious or spiritual, and would like it addressed in their health care. Because religious beliefs are used to cope with illness (either mental or physical), religious patients would like their spiritual needs to be acknowledged and addressed by their physicians (and by nurses who provide more direct and personal care)
- Patients, particularly when hospitalized or imprisoned by chronic illness, are often isolated from their religious communities. Our country has recognized that when people are prevented from practicing their religious faith because of circumstances imposed on them, we have provided the resources necessary for them to practice their faith (based on the principle of religious freedom). This is why we have chaplains in the army, and in federal and state prisons and psychiatric facilities. Hospitalized patients with medical problems or the chronically ill are no different. Many people are hospitalized far away from their religious communities of support (this is especially true for nursing homes, where contact is minimal even when religious communities are nearby).
- Religious beliefs affect medical decisions, and may conflict with medical treatments. This is a very practical reason why health professionals need to communicate with patients about religious or spiritual beliefs. Studies find that 45 percent to 73 percent of seriously ill patients indicate that their religious affect their medical decisions (*Archives of Internal Medicine* 1999, 159:1803–1806; *Journal of Clinical Oncology* 2003, 21:1379–1382; *Family Medicine* 2006, 38:83–84). Yet 90 percent of physicians do not take a spiritual history or discuss these matters with patients, and 45 percent of physicians say that it is not appropriate to do so (*Medical Care* 2006, 44:446–453). How can physicians practice competent medicine if they don't have knowledge about factors that will affect compliance with the treatments they prescribe?
- Religious struggles or spiritual conflicts over medical issues have been shown to predict increased mortality and worse medical outcomes (see *Archives of Internal Medicine* 2001, 161: 1881–1885). If left undetected and not addressed, these struggles may adversely affect disease course despite the best of medical treatments.
- Religion influences health care in the community. Because of the rising costs of health care, most health care is now shifting out of the hospital and into the community. Hospital stays are becoming shorter and shorter (since hospitalization is the most expensive form of medical care), and people are being discharged sicker and sicker into the community. If patients are involved in a religious community, they will have a ready support system that can provide emotional support, monitor compliance, and provide practical services (meals, home-maker services, respite care, rides to physician office). If they are not, then they are dependent on family members for support, and if no family is available, then they are forced to rely on the government. This will become a real issue as our population ages and the medical needs escalate (*Faith in the Future: Healthcare, Aging, and the Role of Religion*—see Further Readings).

(2) What are some sensible ways that clinicians can integrate spirituality into patient care, without prescribing religion or coercing patients to believe or practice? First of all, most of their patients are already religious to at least some degree (recall that up to 90 percent of seriously ill patients in some parts of the U.S. use reli-

gion to cope), so clinicians don't have to promote religion. It's already there. What they do need to do, however, is to recognize it, support it, and consider it when making medical decisions and developing treatment plans. Here are some ways to do that:

- For patients admitted to the hospital or those with serious or chronic medical illness, physicians should take a brief, screening spiritual history that identifies if spiritual beliefs are (1) important to the patient, (2) helping the patient to cope (or, alternatively, are causing spiritual struggles), (3) influence medical decisions or conflict with treatments prescribed, (4) membership in a supportive spiritual community, and (5) whether there are any spiritual needs that someone should address (see *Journal of the American Medical Association* 2002, 288:487–493). This takes about two minutes to conduct.
- Support (verbally and non-verbally) the religious or spiritual beliefs of patients if those beliefs are helping the patient to cope.
- If spiritual needs or conflicts are identified, refer patients to professional chaplains or trained pastoral counselors to address these needs.
- If patients are not religious, then the spiritual history should focus on what gives patients lives meaning and purpose in the setting of illness (grandchildren, hobbies, etc.), and then those activities supported. Religion should never be prescribed, forced, or even encouraged in patients who are not already religious, so as not to add guilt to the already heavy burden of illness. Inquiry and support in this area must always be patient-centered and patient-directed.

(3) Health professionals in hospital and outpatient settings should be willing to accommodate the religious or spiritual beliefs and traditions of patients. Examples: For the American Indian, this may involve altering the environment (or providing alternative environments) so that traditional spiritual ceremonies concerning sickness and death may be performed (if requested by the patient or family). For the Muslim patient, the environment should be altered so that the patient can perform his or her daily prayers, and care arranged so that only gender-matched health professionals give personal care. Religious and cultural sensitivity will help both the patient and the family to cope better with illness, will improve patient and family satisfaction with care, and thereby will likely enhance medical outcomes.

(4) Efforts should be made to ensure that there are adequate numbers of chaplains available so that patients' spiritual needs can be adequately addressed. A recent study conducted by Harvard investigators documented that three-quarters (72 percent) of patients dying of cancer said that their spiritual needs were minimally or not at all met by the medical system (i.e., doctors, nurses, or chaplains) (*Journal of Clinical Oncology* 2007, 25:555–560). Currently, there are only enough chaplains in U.S. hospitals to see about 20 percent of patients (one in five) (*International Journal of Psychiatry in Medicine* 2005, 35:319–23). There are typically no chaplains in outpatient settings and no chaplains in nursing homes. Who meets these patients' spiritual needs?

Recommendations

Recommendations for Members of Congress emphasize their providing support for research on R/S and health (support for both research training and research projects); public education of the role of religion in health and wellness; health professional education on why and how to integrate spirituality into patient care; and motivating health care systems to allow health professionals the time necessary to address the spiritual needs of patients. Finally, recommendations are provided for supporting and integrating efforts by religious organizations in disaster preparation and response.

I. Support Research

(1). Because research on the effects of religious/spiritual beliefs and behaviors is a substantial need, **current barriers at NSF/NIH to funding research on the effects of traditional religious beliefs/behaviors need to be overcome.** This could be done by (1) assigning a specific branch at NSF/NIH to review such grants, (2) ear-marking funds to support such research, (3) establishing review sections at NSF/NIH with the specific expertise and sensitivity to this topic so as to give such grants a fair chance of being awarded.

(2). Provide **NSF/NIH training grants** to support the development of young researchers on university faculty to conduct research in this area, or to help senior

investigators to transition their research into this area. There are currently models at NSF/NIH of junior and senior investigator awards, but none focus on supporting the training of researchers to study the health effects of R/S.

(3). Urge NSF/NIH to develop a **"request for proposals"** (RFP) in the area of the effects of traditional religious beliefs and behaviors on mental, physical, and social/community health. The John Templeton Foundation may be willing to partner with the NSF/NIH to provide support for such a competitive grants program.

(4). Establish an **intramural research program at the NSF/NIH** to examine the impact of religious beliefs and practices on public health, the cost-savings that this might produce, and the effectiveness and acceptability of disease detection and prevention programs within (or in cooperation with) religious organizations, especially in minority congregations.

II. Support Congregational Health Programs

(1). Consider partial government **support for parish nurse programs** within religious congregations that provide disease screening, health education, lifestyle change, and volunteer recruitment and training for service delivery. If that latter keeps members of religious communities in their homes and out of hospitals or nursing homes, then this could represent a substantial cost savings for Medicare and Medicaid.

(2). Along these same lines, encourage the **development of health care system-religious congregation partnerships.** This would involve closer working relationships between local hospitals or medical systems and religious communities for the purposes of providing early disease detection and referral for treatment, volunteer recruitment and training, and the teaching of health promotion activities that encourage self-care, keep people healthy, and reduce the need for expensive medical services (Florida Hospital is a good model to follow). Such efforts could also be expanded outside of congregations to persons in the general community who need services, but have fallen through the cracks of the current health care system.

III. Educate the Public

(1). Develop a public education campaign to help **disseminate research findings** (both past research and new research) on the role that R/S plays in maintaining health and well-being. There is already great public interest in this topic as exemplified by multiple cover stories on spirituality and health in popular magazines such as *Reader's Digest, Newsweek, Time, Prevention,* and others.

(2). Support/encourage **adult education classes** at State and federally funded universities to teach the public about relationships between R/S and health, and how people can take advantage of these relationships to prevent disease, overcome addiction, and enhance their health and well-being. These classes should also emphasize the seeking of timely medical care, and the important role that allopathic medicine plays in health and wellness. Religion and medicine should complement each other, not compete or conflict.

(3). The public should be taught **how to talk with their doctors about R/S.** If religion is important to a patient, should this be a consideration in their selection of a physician? What are some ways that patients can communicate with their physicians about the important role that religion plays in their lives and how it could influence their medical decisions? A recent article by Elizabeth Cohen on CNN.com illustrates such an approach (see website: *http://www.cnn.com/2008/HEALTH/09/11/ep.faith.medicine/index.html?iref=newssearch*).

(4). The public should also be **taught how to talk with their clergy about initiating a health programs** within their local religious congregation. If the 500,000 religious congregations in America all had such programs, then two-thirds of the U.S. population would be exposed to disease detection, disease prevention, and health promotion efforts. Since persons of all ages participate regularly in religious congregations, this means that health education efforts would occur at all ages, from the young (focused on substance abuse prevention and character development) to the middle aged (focused on healthy eating, exercise, stress-reduction, etc.) to the elderly (focused on volunteering, mentoring and generative types of activities).

IV. Include Faith Communities in Disaster Preparation and Response

Part of maintaining public health involves protecting communities who may be in constantly threat of natural disasters and even terrorist attacks, and helping them

to recover if those events occur. Religious organizations already play a big role in this regard, both at the individual level in helping persons cope with the stress of the event and on the community level in helping communities minimize their losses in the short-term and recover over the long-term. What can the government do to support faith-based efforts? Here are some recommendations (see *In the Wake of Disaster* for more details):

(1). **Research and Education.** Research is needed to determine the prevalence of spiritual needs and the extent to which they are met (and by whom) during each phase of a disaster. Further research on the relationship between addressing spiritual needs and long-term mental health outcomes following disasters is critically needed. Systematic data are needed on the activities of clergy and non-clergy volunteers from the faith community following disasters. Although more research is clearly needed, much is already known that justifies a major educational initiative. Education is needed for Emergency Management Services (EMS) agencies/personnel, mental health authorities, and faith-based groups to help dispel myths and misconceptions about each other, to define the unique roles that each group serves, and to emphasize the consequences of not valuing and not including each other in the disaster response.

(2). **Leadership.** Government supported EMS agencies should take the lead in inviting Faith-Based Organizations (FBOs) to participate in disaster planning and response. Government agencies should encourage interested FBO's to identify the types of resources they wish to contribute to the disaster response effort. This may involve efforts to coordinate disaster response; mobilize and train clergy and congregational volunteers to provide psychological, social and spiritual support; raise funds or material necessities to assist victims during their recovery; or many other potential activities.

(3). **Organize and coordinate.** Government supported EMS agencies need to take the initiative to establish a body to coordinate FBO efforts. Once established, it could organize itself into national and local networks.

(4). **Include in Planning Phase.** On the local level, EMS agencies should include deployment of FBO resources as part of their response protocol. As noted above, this would require that the leaders of local FBOs are included in disaster response planning.

(5). **Encourage teamwork, partnership and collaboration.** Partnerships should be encouraged between mental health workers and local faith-based groups. Local mental health workers should be encouraged to visit or participate on local ministerial associations or church councils. In this way, the two groups could develop working relationships and establish referral patterns before a disaster strikes. Mental health counseling services could offer a spiritual component by developing a referral network with local pastoral counselors or clergy. Faith-based groups, in turn, could refer members who need specialized mental health care to mental health professionals. Furthermore, mental health professionals could provide education to faith-based communities on how to identify mental disorders, which kinds of interventions might be helpful, and when to refer.

(6). **Consider making trained clergy "first responders."** Besides offering necessary spiritual support, local clergy are ideally positioned to serve as first responders in meeting the psychological needs of disaster survivors and triaging those with more complex needs to mental health professionals—enhancing the efficiency with which scarce specialized mental health services can be delivered. In many communities, clergy serve this function anyway following disasters (by default). However, making this part of the formal EMS response would help to systematize and coordinate the effort.

(7). **Credential.** There needs to be a way of screening clergy before sending them out into the field to ensure that they are adequately trained. Basic national standards should be established for credentialing clergy, as well as methods of identifying clergy credentialed in disaster response prior to a disaster. This needs to be done as part of pre-disaster planning to ensure that it is part of a coordinated response.

(8). **Fund.** First, provide greater flexibility in support mechanisms by offering more grant options than SAMHSA currently offers. The options should address the pastoral care needs of disaster victims during long-term recovery extending beyond the first few months after the event. It is during recovery, as people begin to put their lives back together, that issues of meaning and purpose in life begin to surface and pastoral care services are most needed. Second, make it easier for FBO groups to apply for available funding to help support their preparation and response.

V. Educate Health Professionals

(1). Physicians, nurses, social workers, counselors, and hospital administrators need to be **informed of the existing research on R/S and health, and the rationale for integrating spirituality into patient care.** Most health professionals did not receive training on how to do this, and many are nervous about doing so and feel unprepared. They don't know how to take a spiritual history or what to do with the information they learn from it. They don't know what a chaplain does, the type of training a professional chaplain receives, or how the chaplain can be useful to them or their patients. They don't know what benefits might result from their addressing the spiritual needs of patients and ensuring that those needs are appropriately addressed. Many medical schools are now developing courses on religion, spirituality and medicine for medical students. In fact, nearly 100 of the 141 medical schools in the U.S. and Canada now have such courses (70 percent of which are a required part of the curriculum).

(2). These medical courses, however, are a relatively new development. In 1992, only three medical schools had such courses. As a result, most physicians in practice today have no training in this regard. The same is true for nurses and other health professionals. This means that **CE (continuing education) programs are needed** to train current health professionals about how to sensitively and sensibly address spiritual issues with patients. These CE programs could be held at regional medical centers or in local hospitals, with several institutions linked by video-conferencing or Internet-based methods.

VI. Initiate Health Care System Changes

(1). Even with adequate education and training, **health professionals need time to address the spiritual needs of patients.** Administering a screening spiritual history, supporting patients' beliefs, and referral to pastoral care all take time, precious time that most health professionals don't have in the busy clinic or hospital setting. While freeing up such time will be modestly expensive in the short-term, there is every reason to think that it will be cost-effective in the long-term. If patients have their spiritual needs addressed, this will likely influence their health over the long-term and reduce their need for future health services (as well as enhance satisfaction and help them move more smoothly through the health system). In the only clinical trial that has examined this possibility, researchers found that physicians taking a spiritual history (which added 2.1 minutes to the visit) resulted within three weeks in oncology patients experiencing less depression, greater functional well-being, and a strengthening of the doctor-patient relationship (see *International Journal of Psychiatry in Medicine* 2005, 35:329–347).

(2). Government-funded health programs should emphasize the importance of health professionals addressing the spiritual needs of patients and need to free them up from other responsibilities to do so (this is true for physicians, but perhaps even more true for nurses). This may require providing monetary or some other types of incentive for hospitals to free up time for physicians, nurses, social workers, and chaplains to address these issues. Perhaps tying this to **Medicare/Medicaid reimbursement** based on post-hospitalization patient satisfaction surveys might be one route to go. This would require that all hospitals include post-hospitalization surveys that assess patient satisfaction with spiritual care, which few such survey currently do.

Suggested Readings

Medicine, Religion and Health. Templeton Press (September, 2008)

The latest review and discussion of research on religion, spirituality and health (including both mental and physical health), written in a reader-friendly, non-researcher format (updates the *Handbook of Religion and Health,* 2001). Length: 235 pages. To order, go to website: *http://www.templetonpress.org/book.asp?book_id=124*

Spirituality in Patient Care, 2nd Edition. Templeton Press (2007)

This book is for health professionals interested in identifying and addressing the spiritual needs of patients. It addresses the whys, hows, whens, and whats of patient-centered integration of spirituality into patient care, including details on the health-related sacred traditions for each major religious group. This book provides health care professionals with the training necessary to screen patients sensitively and competently for spiritual needs, begin to communicate with patients about these issues, and learn when to refer patients to trained spiritual-care professionals who

can competently address spiritual needs. Sections specifically address mental-health professionals, nurses, chaplains and pastoral counselors, social workers, and occupational and physical therapists. A ten-session model course curriculum on spirituality and health care for medical students is provided, with suggestions on how to adapt it for the training of nurses, social workers, and other health professionals. Length: 264 pages. To order, go to website: *http://www.templetonpress.org/book.asp?book_id=105*

Handbook of Religion and Health. Oxford University Press (2001)

This is a comprehensive review of history, research, and discussion of religion and health. Its 35 book chapters span mental and physical health, from well being to depression to immune function, cancer, heart disease, stroke, chronic pain, disability, and others. Appendix lists 1200 separate scientific studies on religion and health that are reviewed and rated on 0–10 scale, and followed by 2000 references and extensive index for rapid topic identification. This is the most cited of all references (books, book chapters, and peer review articles) on religion and health. Length: 714 pages.

The Link Between Religion and Health: Psychoneuroimmunology and the Faith Factor. Oxford University Press (2002)

Edited volume (15 chapters) examines the role of psychoneuroimmunology as an explanation for the link found between religion and physical health. Leaders in psychoneuroimmunology discuss their respective areas of research and how this research can help elucidate the relationship between religion and health. This volume reviews research on religious involvement, neuroendocrine and immune function, and explores further research needed to better understand these relationships. Length: 304 pages

Faith in the Future: Healthcare, Aging and the Role of Religion. Templeton Press (2004)

This book presents a compelling look at one of the most serious issues in today's society: health care in America. How will we provide quality health care to older adults who will need it during the next 30–50 years? Who will provide this care? How will it be funded? How can we establish effective, comprehensive, and cost-effective systems of care as demographic and health-related economic pressures mount? Innovative programs created and maintained by volunteers and religious congregations are emerging as pivotal factors in meeting health care needs. Summarizing decades of scientific research and providing numerous inspirational examples and role models, the authors present practical steps that individuals and institutions may emulate for putting faith into action. Length: 200 pages. To order: *http://www.templetonpress.org/book.asp?book_id=63*

In the Wake of Disaster: Religious Responses to Terrorism & Catastrophe. Templeton Press (2006)

Based on White Paper produced for the Center for Mental health Services (CMHS) of the U.S. Department of health and Human Services (DHHS). Examines psychological responses to natural disasters and acts of terrorism, outlines the emergency response system in the United States, and describes that role that individual religious faith plays in coping with disaster. However, the main focus of the book is describing the role that faith-based organizations play in responding to disasters, and discusses the many ways that they are involved at all stages whenever a disaster strikes. See pp. 109–119 for recommendations to public policy-makers. Length: 162 pages. To order: *http://www.templetonpress.org/book.asp?book_id=84*

Faith and Mental Health: Religious Resources for Healing (Templeton Press, 2005)

This book is also based on White Paper produced for the Center for Mental health Services (CMHS) of the U.S. Department of health and Human Services (DHHS). It provides an updated review of the history, research, and interventions related to religion and mental health. The focus is on examining faith-based delivery of mental health services. Five faith-based organizations are discussed: clergy and local religious congregations, networking and advocacy groups for the chronically mentally ill, national religious organizations that deliver mental health services, and groups that deliver faith-based mental health services but do not belong to a national religious group (religious counselors, chaplains, pastoral counselors). See pp. 255–275 for recommendations to public policy-makers. Length: 342 pages. To order: *http://www.templetonpress.org/book.asp?book_id=80*

Handbook of Religion and Mental Health. Academic Press (1998)

Due to our religiously diverse society, *The Handbook of Religion and Mental Health* is a useful resource for mental health professionals, religious professionals, and counselors. The book describes how religious beliefs and practices relate to men-

tal health and influence mental health care. It presents research on the association between religion and personality, coping behavior, anxiety, depression, psychoses, and successes in psychotherapy, and discusses specific religions and their perspectives on mental health. Chapters address clinical considerations when treating Protestants, Catholics, Mormons, Unitarians, Jews, Buddhists, Hindus, and Muslims. Length: 408 pages.

BIOGRAPHY FOR HAROLD G. KOENIG

Dr. Koenig completed his undergraduate education at Stanford University, his medical school training at the University of California at San Francisco, and his geriatric medicine, psychiatry, and biostatistics training at Duke University Medical Center. He is board certified in general psychiatry, geriatric psychiatry and geriatric medicine, and is on the faculty at Duke as Professor of Psychiatry and Behavioral Sciences, and Associate Professor of Medicine. He is also a registered nurse (RN).

Dr. Koenig is founder and former Director of Duke University's Center for the Study of Religion, Spirituality and Health, and is founding Co-Director of the current *Center for Spirituality, Theology and Health* at Duke University Medical Center. He has published extensively in the fields of mental health, geriatrics, and religion, with over 300 scientific peer-reviewed articles and book chapters and nearly 40 books in print or in preparation. He is the former Editor-in-Chief of the *International Journal of Psychiatry in Medicine* and of *Science and Theology News.* His research on religion, health and ethical issues in medicine has been featured on over 50 national and international TV news programs (including The Today Show, ABC's World News Tonight, and several times on Good Morning America), over 80 national or international radio programs (including multiple NPR and BBC interviews), and hundreds of national and international newspapers or magazines (including cover stories for *Reader's Digest, Parade Magazine,* and *Newsweek*). Dr. Koenig has given testimony before the U.S. Senate (September 1998) and the U.S. House of Representatives (September 2008) concerning the effects of religious involvement on public health. He has been interviewed by James Dobson on Focus on the Family and by Robert Schuller in the Crystal Cathedral on the Hour of Power. Dr. Koenig has been nominated twice for the Templeton Prize for Progress in Religion.

His books include *The Healing Power of Faith* (Simon & Schuster, 2001); *The Handbook of Religion and Health* (Oxford University Press, 2001); and his autobiography, *The Healing Connection* (2004); *Faith and Mental Health* (2005); *In the Wake of Disaster* (Templeton Press); *Kindness and Joy* (2006); *Spirituality in Patient Care,* 2nd edition (2007); and *Spirituality and Medicine* (2008) published by Templeton Foundation Press. Dr. Koenig travels widely to give workshops and seminar presentations (see
http://www.dukespiritualityandhealth.org/about/speaking_engagements.html).

DISCUSSION

Chairman BAIRD. Thank you, Doctor, and thanks to all our witnesses for outstanding comments and observations and most informative.

We will proceed now in the questioning. I will yield myself, recognize myself for five minutes, and then we will follow with my colleagues.

First of all, I want to thank you all. As a social scientist, some of the friends here from the social science community will recognize that I have been one of the most passionate advocates and harshest critics of my own disciplines, and the reason is I believe we have so much to offer, and we so often don't offer it as well as we can. And the exception to that is illustrated by the testimony today. And I congratulate you.

What I find most impressive is that we are talking about rigorous empirical designs, followed by applications in the real world, followed by testing those applications with real world impacts. And all of this stemming in many cases from basic research that then

gets moved up as science is supposed to. And with real world impacts.

What I would like to do is follow up on each of the examples, and we will probably have a second round of questions as well.

Let me start, we will just follow in order. Dr. Barrett, when you talk about the example of teaching emotional, I am blanking on the word. Literacy. Thank you. So I may, give us an example of how you would do that with a person and with what impact that might have. How would it change things?

Dr. BARRETT. Sure. Well, I mean, first of all, I should point out that I don't personally do work on emotional literacy. That work is actually being done by other people. I did the basic research, and my lab pretty much continues to do basic research on emotions.

Chairman BAIRD. Well, let me jump to the basic research then.

Dr. BARRETT. But I can answer that question——

Chairman BAIRD.

Dr. BARRETT.—for you. So basically, I mean, my husband tells a joke. Right. The joke he tells is that when he first met me, he knew three emotion words; happy, sad, and hungry. And——

Chairman BAIRD. My kind of guy.

Dr. BARRETT.—that usually gets laughs but, you know, but the point being that what you do, what emotional literacy programs do is they turn people into emotional experts who have a large emotion vocabulary, so they have a lot of different words for emotion, and they understand the distinctions between those words. So they understand the difference not just between anger and sad but between irritation and anger and rage. And they use those words to help them to better see emotion, you know, more precisely see emotion in other people, to more precisely label their own responses, and to better know how to act.

So if I just feel bad, that doesn't tell me very much about what to do next. However, if I understand that I am feeling irritated as opposed to enraged, then I can plan something more, my response a little bit more precisely.

So it basically has to do with using words to shape the experience of emotion and the perception of emotion, to be able to see emotions in others. And this sort of sounds like just word play until you realize that actually words have, are a constitutive rule in emotion, that is, emotions, you know, there was just an article in Newsweek this week about emotion, that, you know, fear can be found in this part of the brain, and anger can be found in that part of the brain, and you know, that is, it is an unfortunate article, because there isn't a tremendous amount of science to back up those claims.

And so if you take a model like that, then it seems like this is just wordplay. But if you believe that the words that people use and the language that they speak actually has some real informing emotions and in grounding emotion perception, then it becomes a completely common-sensical thing to do.

Chairman BAIRD. And your research and that of our colleagues in the field has been able to empirically identify that people differ in how they process their own emotional experience and communicate their own emotional experience, and that that difference then relates to a host of other variables.

Dr. BARRETT. Yes.

Chairman BAIRD. And by educating people about these issues, you can then influence other variables.

Dr. BARRETT. Yes. Exactly. So in our lab we spent almost a decade doing research that was funded both by the, mainly actually by NSF with some support from NIH but mostly it came from NSF, where we did something called, we call it experience sampling, but basically people almost, over 700 people took little palm pilots out into the world with them, and we measured a number of things about their emotional experiences and then brought them back into the lab and did very controlled measurements there of their body, of their faces, and so on. We actually also did some brain imaging with these people, and what we found really clearly was there is no question that people vary in, not just in the words that they know for emotion but actually in the precision of their experiences and that these have effects in peoples' ability to perceive emotion in others and to regulate their own responses and so on.

Chairman BAIRD. Great. Thank you.

I am going to go over my time just a little bit, because I want to follow up with Dr. Jemmott. I want to compliment you for your courage. In this institution over the last few years anything dealing with sexuality has been a target for reverse earmarking. By that I mean Members of Congress during an appropriations debate target studies based solely on their title. Dr. Ehlers and I both have been enraged by this in the past, knowing nothing about the study. They just say, oh, this deals with sex. We don't think we should spend any money on sex, therefore, we are going to cut the budget.

What you have done is stepped forward and said, look. We can make a research-based effort to identify how to intervene in a deadly behavior and disease system and apparently with good results.

Could you give it some sense of outcome? Just, you talked about the various metrics against which you measure. Just give us a sense of, you know, you got these various intervention programs. What are the outcome? What have we seen in terms of outcome for these things?

Dr. JEMMOTT. Well, one study that we, we have done two——

Chairman BAIRD. Make sure, please make sure your mic is on up there. Maybe. That is hard. You might want to lower the mic a little bit to yourself. Okay.

Dr. JEMMOTT. Okay. We did two studies that were done in clinics, and when you are working in a clinic, it is possible to have actual sexual outcomes in terms of sexually-transmitted diseases. One study was with African-American women in Newark, New Jersey, and the educators in that study were nurses. We developed a very, very brief intervention that is appropriate in that setting, 20 minutes, and it dealt with the skills necessary to use condoms and to reduce your number of partners, et cetera. And——

Chairman BAIRD. It is not just how to put a condom on. It is how to convince your partner that a condom is the way you are going to go.

Dr. JEMMOTT. Absolutely. And it is using it correctly as well. And we followed the women who received the intervention for a year, and we found that those who received the intervention had a lower

rate of chlamydia, gonorrhea, and trichomoniasis compared to a control group of women who also received an intervention from nurses that dealt with chronic disease prevention.

We did a similar study in Philadelphia with African-American and Latino adolescent girls who were 15, about, approximately 15 years of age. They were all sexually experienced. They were in the adolescent medicine clinic. They received a skill-building intervention. Some of them received an intervention that dealt with chronic disease prevention, and we followed them for a year. We found significant reductions in their number of partners, increased use of condoms, and a lower rate of chlamydia, gonorrhea, and trich, trichomoniasis in that study as well.

So we have been able to have outcomes in terms of sexual behavior as well as sexually-transmitted disease. Obviously when you work with younger populations it is not really feasible to look at sexually-transmitted disease as an outcome, so in those populations you want to look at self-recorded behaviors, especially abstinence.

We have a study that we just completed in South Africa that is currently under review where they were grade six students in South Africa, hardly any of them were sexually active at the beginning of the study. Their average age was about 12, and only three percent were sexually active. We followed them for a year after the intervention, and fewer of them reported sexual intercourse over that period, unprotected sex, and reported fewer partners, you know, again, compared to a control group that received the chronic disease prevention, intervention.

So we have had some positive outcomes, you know, not just here in the United States, with a variety of populations but also overseas.

Chairman BAIRD. And especially given that you are speaking today on the HIV capital of the United States of America.

Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. Just a quick follow up. Did I understand you correctly to say that your abstinence program actually worked?

Dr. JEMMOTT. Yes.

Mr. EHLERS. Because we have a lot of debate about that here in the Congress.

Dr. JEMMOTT. Yes. We have an abstinence program that works. It worked in a study that we did here. We have had two of them. One worked briefly for three months, but then in a second study, which is also under review right now, we followed the adolescents for two years and found a significant effect of our abstinence intervention in reducing initiation of sexual involvement.

And the participants were grades six and seven African-American adolescents in Philadelphia, and again, it was compared to a control group of adolescents who learned about chronic disease prevention.

Mr. EHLERS. Thank you. And Dr. Kenkel, you mentioned some studies on how increasing costs led to reduction of use. I assume that applies only for non, the beginning of use of non-addictive substances, or would that also apply to someone who is smoking or someone who is using hard drugs? Did the cost increase result in

less use, or is it beyond help simply because it is an addictive behavior?

Dr. KENKEL. No. Actually the research suggests that a number of addictive behaviors, addicts do seem to respond to higher prices. There is a controversially-named theory at least developed by Gary Becker and Kevin Murphy at the University of Chicago called model of rational addiction. Now, I know to a lot of people that almost sounds like an oxymoron, but the basic idea is simply that addicts still respond to the same kind of incentives that non-addicts do, and it may be difficult, and it certainly is more difficult to change behavior, but, again, there is evidence that shows that when the price of cigarettes go up, people are more likely to quit smoking. My research found pretty heavy drinking responded. Maybe not the heaviest drinking but some very heavy drinking seemed to respond to higher prices. And there has been some research that looked into the same kind of price responsiveness of illicit drugs, including heroin. And all of those find some evidence that higher prices can reduce consumption of these goods, even by the addicts.

Mr. EHLERS. And even for hard drugs then?

Dr. KENKEL. The hard drug, there has been some studies. I mean, that is a very, very difficult——

Mr. EHLERS. Yeah.

Dr. KENKEL.—thing to study. I mean, basically on the data we don't know that much about the use, nor do we know exactly about what prices people are paying. So trying to figure out how much prices affect use, it is a doubly difficult challenge. But there have been some studies that indicate that, yes, even the heroin——

Mr. EHLERS. And Dr. Koenig, I really enjoyed your presentation, perhaps because I am a religious person, but I suspect most everyone just drives themselves that way in some fashion.

But what, are there any implication you can draw? You can't somehow instill religion in a person to try to improve their health.

Dr. KOENIG. Yes.

Mr. EHLERS. And another question is is it perhaps the health outcomes are related to the fact that a number of religious behaviors are related to health? For example, for years some denominations have strongly discouraged smoking, long before the Surgeon General's report. Others discouraged drinking very strongly.

Is it related to that, or is it, in fact, intrinsic to the belief of the person, him or herself?

Dr. KOENIG. It is related to as you described, better health behaviors, less cigarette smoking, more exercise, et cetera, et cetera. The religious, you know, beliefs that say you shouldn't over drink, et cetera, et cetera, so that is a major factor.

Also, there is the social factor, the fact that people have more support in religious congregations, and then also there is the cognitive, the beliefs themselves. They oftentimes are positive or optimistic about coping with stress, about deriving meaning to the negative experiences which help people to cope better.

In terms of the applications, there are practical applications. Because it is so common, so frequent that people have religious beliefs and behaviors, how are those affecting health? And how as people become more secular in this country, how will that affect the in-

crease in health problems? And so those are just some of the issues. Clinically there is the issue of people have spiritual needs, and doctors aren't addressing them. Ninety percent of doctors never even talk to a patient about their religious beliefs, and yet those are affecting their compliance, their coping with illness, et cetera.

So those are the issues.

Mr. EHLERS. Okay. Thank you. I was just reading the Old Testament recently and the early part of it, and it is just striking reading through all the rules and restrictions that Moses put in place, how many of them are really health related. So this goes back a long way.

Chairman BAIRD. Dr. Lipinski.

Mr. LIPINSKI. I would like to thank the Chairman for holding this hearing and the hearings that we have held and probably most importantly right now is last year in the fight where there was a threat to NSF funding for social sciences, and Dr. Baird really stepped up there, and I gave a little bit of help there, but we made sure that that wasn't, we made sure we took care of that in the America COMPETES Act.

And Chairman Baird is the only one who I allow to call me Dr. Lipinski, and this is the only place he is allowed to do it, here in this Subcommittee. I do have my Ph.D. from Duke in political science, so I have fond memories of Duke, a great university. I spent maybe too many years in school. One of the classes that I remember more from than any other perhaps, when I was at Stanford I took a, got a degree in engineering economic systems. Decision analysis was something that was, I was very interested in. I took a class from Amos Diversky, and you know, decision theory, and really the fact that the risk aversion that people have and how people make choices not really necessarily based on what economically would seem to be the clearer choice.

So I really think that so much of that could be used, utilized in making public policy, and Dr. Kenkel, I know you were, you know, you were talking about incentivising. We do a lot of that in public policy, although sometimes we don't like to admit that. But I think a lot of the research that you were doing you are talking about in terms of smoking, some of that is obviously economic when you are talking about whether or not the economics actually impacts people who are addicted to drugs. And I think that is very important work, but also looking at, beyond the economics of what psychology tells us about choices that people make.

What you, I just want to ask you, Dr. Kenkel, what else, what do you think we should be doing more of here in terms of helping to, you know, put the question aside of what policy should we be doing to incentivise what behavior we want to see more of or less of here in this country, but what should we be doing in terms of funding? How could we better fund, you know, the type of research that would be helpful to us in making public policy?

Dr. KENKEL. That is a tough question obviously. In the kind of social science research that health economists use relies very heavily on secondary data sets, and so as I said, mentioned before, you know, the continued support and expanded support for the ongoing data collection efforts of both the Federal Government and also, you know, investigator-initiated data collections. You know, I am

thinking about these ongoing, longitudinal data sets like the Michigan Panel Survey of Income Dynamics or the Fireman Health Surveys, provide incredibly rich resource for health economists and other social scientists to both explore the questions that, you know, the data sets were designed to answer but also a lot of times to exploit them to answer some new questions. So I think a lot of times the, a lot of the economics research actually wasn't planned necessarily to be used in these data sets, but we suddenly realized we could exploit the natural experiment that was created in the data, using ongoing data collection.

With that, I think providing a support for some of the new developments in data collection, biomarkers, for example, are an exciting idea to connect some of the traditional social science kind of variables about schooling and income and socioeconomic status with data actually on a much more health-related, even genetic-related information, something they are beginning to use.

The same types of innovations would really also be possible, I think, and should be encouraged in kind of trying to provide those links between economics and the other social science. New sub-field of economics known as behavioral economics, which exactly tries to do what you suggest, that is, import the insights from psychology and improve the economic models to explore when is it going to be the case where the economic model isn't really capturing fully what is going on. And can we get to an improved understanding and therefore, also maybe improve public policies by kind of combining our forces with psychological data.

And, again, I guess it just shows, you know, the kind of research I do, I keep on coming back to sort of facilitating data collections and facilitating cooperations between social scientists of different disciplines. Some of the most important ways I think you could support the type of research where I think it needs to go.

Mr. LIPINSKI. Thank you. I thank all of you for the work that you are doing in multi-disciplinary research. I found when I was a political scientist that there wasn't nearly enough of them. It seems like there is more of a push in recent years to do that, so I think that is very helpful.

Chairman BAIRD. Thank you, Dr. Lipinski.

Mr. LIPINSKI. I yield.

Chairman BAIRD. And that, actually that issue of interdisciplinary work is part of what was included in the America COMPETES Act, of course, and I would note on the issue of behavioral economics that cognitive economic work really of Canaman and Diversky and that group, in my judgment certainly could help us understand the collapse that this country is experiencing right now.

If you look at the cognitive biases and decision-making confirmation bias, for example, is one area. Maybe we have a hearing, which would be, hindsight is 20/20, but if you look at the role of confirmation bias, that simple cognitive error is so profound in getting people to believe that this market couldn't do what it has done, we might be able to somehow prevent prophylactic measures, cognitive prophylactics in the financial markets would be an interesting topic for somebody's dissertation at some point.

We will have another round, so if you have other comments, I see Dr. Barrett has something, but I want to make sure we get to Dr. Bartlett, and then we will come back around.

Mr. BARTLETT. Thank you very much. Dr. Barrett, thank you for your concern about the amount of money that goes into basic research. We are starving almost everywhere. I regret that we require you to indicate in your grant application for basic research where it might have a societal payoff. We ought to be pursuing knowledge. There will be societal payoff. There is no way of knowing ahead of time where that societal payoff will be. But the average American doesn't understand that, and we have a truly representative Congress.

Dr. Jemmott, your comments were very interesting. HIV AIDS is a very unique disease. It is essentially universally fatal. We can slow the process down. It is the only disease I know in a very long time which would totally disappear in one generation with appropriate behavioral change. Isn't that true?

Dr. JEMMOTT. Yes. Ultimately it would.

Mr. BARTLETT. So your research is enormously invaluable. Let us get there. It is very unique. Kills everybody who gets it, but it would disappear totally in a generation with appropriate behavioral changes. So thank you very much for your contributions.

Several years ago I was driving and over the radio there were three reports. Two people had died in New York City from something that might have been citicosis, and if it was citicosis, it might have come from dried pigeon manure, so there was a fairly serious suggestion we might ought to kill all the pigeons in New York City because two people died.

That same radio report said that there was a report of the deaths that occurred in cigarette smoking. The last in which I saw a date was 472,000. By the way, it took cigarettes less than three days to kill as many people as the terrorists killed on 9/11. And in that same report there was a report of flying saucers over Oklahoma.

Well, I thought, gee. If I was coming here from somewhere else, and I saw a society where two people died in New York City that might have had citicosis, and if it was citicosis, it might have come from dried pigeon manure, therefore, we are going to kill all the pigeons in New York City. And 472,000 people died from cigarette smoking, and they were still advertising cigarettes. I think I would want to fly around a bit, too, before I landed.

This is just insane, isn't it? You know, I can't yell fire, fire in a crowded theater because somebody might get hurt leaving. And yet they can advertise cigarettes to my grandkids and my great-grandkids when it kills 472,000. Is there any logic in that?

I just can't see the—see, I don't, if you want to smoke, you go ahead and smoke, but I want no cigarette advertising. If I can't yell fire in a crowded theater, you can't have cigarette advertising. Buy it if you wish, but it is dispensed from under the counter in a brown paper wrapper with skull and cross bones on it. A rational society I think would do that.

Dr. Koenig, you mentioned the increase in lifestyle from those who are religious. I am a Seventh Day Adventist, and we and Mormons live seven years longer than the average. I don't know that other people are less religious than we. Don't you think lifestyle

has a whole lot to do with that? Because we have a very different lifestyle.

Dr. KOENIG. Yes. Absolutely. Lifestyle, behaviors, and it starts from childhood on, the way kids are taught and the decisions that they make with regard to their sexual practices, their drinking, their smoking, everything. Studies show that religious youth are more likely to sleep better, more likely to take vitamins, more likely to get regular health care, regular dental care. Religion impacts in so many ways in terms of their health, their healthy lifestyles, their health behaviors, their decisions.

Mr. BARTLETT. Then why are we so hesitant politically to talk about religion when it has so many positive benefits? Why are you kind of relegated to the, well, not lunatic fringe, but some fringe, and if you talk about religion and you are in politics.

Dr. KOENIG. It's the same way in health care. You talk about religion, you are immediately marginalized.

Mr. BARTLETT. Yeah. Why is that?

Dr. KOENIG. I don't know.

Mr. BARTLETT. Any of the rest of you have any observations why you are marginalized wherever your discipline is when you talk about religion?

Dr. Barrett.

Dr. BARRETT. Well, you know, a couple of years ago a major social, the major research conference in social psychology, people asked this question exactly. They asked the question of you could count, why is it that you can count on one hand the number of social science, social psychologists who study religion when it is, you know, a foundational aspect of many, in fact, now we hear most people's lives certainly in the United States. And, you know, I think that the answer that people came up with at this meeting was multi-faceted.

First of all, it is often, you know, science often overlooks the most obvious things. I mean, overlooks the things that are right in front of you and that seem most obvious. Right? Nobody, very few people actually do research on the psychological impact of touch, yet we touch each other all the time. We shake hands, we pat people on the back, we hug our children. You know, there is not a lot of research on this topic even though it is a very, very basic thing.

But also for some reason it, you know, there is a certain stigma to, there has been a certain stigma, the same kind of, to religious, to public discourse about religion in the same way that there is stigma for lots of things that seem natural and obvious. I mean, paradoxically like sex. And so the reason why there is stigma I don't think anybody really understands, although people are interested in this topic and are starting to study it. But there is, you know, sociologists and social psychologists have a lot of understanding about stigma and how it influences behavior.

The irony, of course, is that the federal funding agencies are not funding that. They don't fund research on stigmas so much anymore, and if they do, it is in very limited pockets. But it is a topic that has been around in social psychology both from a social standpoint and from sociology for, really for 100 years.

Mr. BARTLETT. Thank you, Mr. Chairman. We might look to Hollywood for a little of the problem.

Chairman BAIRD. And for the problem with smoking, Dr. Bartlett. It is amazing the implicit message about smoking that has come through Hollywood in recent years. You can't advertise cigarettes on television, but you can sure show every actor that the kids look up to smoking a cigarette in almost every scene anymore.

Dr. Kenkel, I particularly appreciated your comment, I will recognize myself for five minutes. We will do a second round and then—about it is not what you know that is so much trouble, it is what you know that ain't so. One of the great values of the social science research is the counter-intuitive finding. I remember some years back there was the program called Scared Straight. This was the idea that we were going to take kids and put them in, kids, juvenile offenders, we were going to take them to the really hardcore, I think they did this in Rahway, New Jersey. They were going to take them and scare them to death, and this was, got a national TV show about it and there were programs initiated in State Legislatures across the country. And then, thank goodness, some social scientist actually did some follow-up research, and if my recollection serves correctly, the kids who had gone through the Scared Straight Program had a higher recidivism rate than the kids who hadn't.

And the counter-intuitive was a lot of people thought, well, we will take those kids there, and we will scare them to death. The kids apparently thought, gee, I want to be a bad, tough guy like those guys in prison, and the case is true in some of our interventions. There is some fascinating research about on the economic, behavioral economic realm recently about if people have paid a certain amount, does that provide a disincentive or a justification.

And so I commend you for raising this issue, because sometimes it is not confirming what we think it would be but disconfirming the so-called common sense assumption.

Tell us a little more about this advertising of smoking cessation products. Flush that out a little bit for us. It is apparently illegal to advertise these things, but if we did, we could save a lot of lives. Again, back to Dr. Bartlett's paradox, I am sure that was a negotiated deal with the cigarette companies probably but——

Dr. KENKEL. Well, it is no longer illegal. Actually, the irony of the advertising situation was one of the first things that attracted us to the topic. We are looking at magazine advertisements for these products back in the 1990s when most of these products were by prescription only. And because they were by prescription only, when, a company could advertise say the nicotine patch, but then they would have to have a full page of fine print disclosure of all the contraindications about how bad nicotine was for you.

At the same time in the same magazine, the next page, you could have an advertisement for Marlboro's, anther nicotine delivery system, and they only had to have that tiny little, you know, Surgeon General's box. And so we looked at this thing, you know, why is it that we seem to be regulating the ads for the products that will help us quit smoking and making it more difficult to advertise them than we are advertising for the actual products we are trying to get rid of, you know, in the public health approach.

So we actually looked at sort of two aspects of our research on the smoking cessation advertising. One that I mentioned in the tes-

timony earlier was that when people see more of these ads on, in magazines at first, and we are extending the research to look at television ads, it really does seem to be, help stimulate them to think about quitting.

And interestingly enough a lot of the times when they think about quitting after they use, they see the ads, they don't necessarily even use the product, which in economic jargon is sort of a positive externality, the idea that some of the social gains from the advertisements, the firms are not managing to gather as higher profits, but they are doing, improving public health.

Now, the earlier part of our research also looked at the effect of the regulations on the firms' decisions to advertise themselves, and we found that when products went from prescription to over the counter, this changed the way the advertisements are regulated and made it a lot easier to advertise, and therefore, the firms advertised a lot more. So when you start putting those two things together, you realize that the way we were regulating prescription products for smoking cessation actually probably worked to discourage smoking cessation.

Chairman BAIRD. But you now can see, so that is no longer an issue.

Dr. KENKEL. Yes. So now most of the products are over the counter——

Chairman BAIRD. Okay.

Dr. KENKEL.—and that is why they are all, but you see the same thing going on now, you know, another possibility, we haven't done this research yet, would be on things like the statins for cholesterol reduction. A lot of the statin drugs are going to still be by prescription only, and therefore, they are relatively difficult to advertise. And it is not clear that perhaps the public health goals might be better served if we made it easier to advertise things like statins as easy as it is to advertise the Big Macs that give us the cholesterol in the first place.

Chairman BAIRD. Dr. Koenig, I appreciate your testimony very much, and I think there has been attention in the social sciences, pro and con. I mean, it is also true that some of the criticism of studies, for example, in the realm of Dr. Barrett's research and literacy, emotional literacy, can also be opposed on the religious side. In other words, there are some religious institutions that pass out to their parishioners lists of key terms that say if your child is going to school and they use the word, emotional literacy, well, that is covert, secular humanism, and I mean, these things, a little less so today, but some real counter attacks and issues of Dr. Jemmott's type of research. Using a condom is implied to instill, to promote sexual behavior, so, therefore, it is abstinence only. The debate is not about whether, the real debate, the substantive debate is not about whether abstinence can prevent sexually-transmitted disease. By definition it can. The question is does abstinence only have superior outcomes to abstinence with education about responsible decision-making, appropriate use of prophylactics, et cetera.

Can you comment on the dual nature of that tension and how we can be sort of more respectful of the positive contributions on both sides.

Dr. KOENIG. Yes. There are plenty of negative effects that religion can potentially have, and those are really understudied as well as the positive effects. There has been such a resistance, though, within the field of science to study anything about religion at all because of this conflict between religion and science. And to try to better understand part of it in the mental health field, as you may know, you know, our profession has, if anything, been negative towards religion. It has excluded it. Freud said it was a neurotic obsession, and it was unhealthy, and you did, you got psycho-analyzed so that you would get rid of it, and you would be healthier.

Chairman BAIRD. Well, Williams James didn't.

Dr. KOENIG. Williams James. No. He was in favor of or he described the phenomena in positive ways. And that created this whole negative view towards religion, and even within medicine today the only time it comes up is when there is a conflict, when there is an issue of abortion or a Jehovah Witness refuses blood products, and then it comes up in the discussions in the teaching centers. But otherwise these positive effects that we have been talking about are ignored largely because there is fear to talk about it, to get involved in it.

And so we need education. Education is critical for health professionals, for researchers to help them study this area that is so common and has an impact one way or the other on public health.

Chairman BAIRD. I really appreciate your presence and compliment Dr. Ehlers for identifying this aspect of the hearing today.

And would recognize Dr. Ehlers for five minutes.

Mr. EHLERS. Thank you, Mr. Chairman, and just continuing on that topic, it has always been a real puzzle to me since I came to Washington, if you read the documents on which this nation is founded, it is very striking, and not just the documents founded on but the writings of Jefferson, Adams, and so forth. Very explicit references to the religious faith constantly.

And today it is the opposite attitude, and I don't know whether to blame Freud or someone else. But it is, you know, the founders were so eager to defend religion they had the First Amendment guaranteeing freedom of religion. Today is seems to be trying to have freedom from religion. And I don't understand the phenomenon myself.

I have to comment on Dr. Bartlett's comments, my good friend, who, when he talks about religious stigma and then Hollywood, reminds me of a friend of mine who is a movie, in the movie industry in Hollywood and frequently is asked to come to cocktail parties generally on a Saturday night, and one of his favorite things to do is to go around the room and talk to the actors and directors and all those and ask them a simple question. What percentage of the people in America do you think will be in church tomorrow morning? And then a number of years of doing this the highest percentage that was ever given him was 10 percent. The average was two percent. As you said it is over 50 percent.

There is an incredible disconnect between the Hollywood and reality. But it is not just Hollywood. It is a lot of people who feel the same way.

In relation to your comments about the relationship of religion and health, we have a mental hospital in my district, which was founded by the denomination I happen to belong to. That is neither here nor there, but they started it years ago and was designed to take into account this relationship between religion and mental health. They are now, I believe, the second largest mental hospital in the United States. And they don't, they are not restricted to religious people coming there, but they have a lot of people coming there just because they provide such excellent care. And that is one the factors, and I thought you might be interested in that.

Dr. Barrett, oh, I have to comment, too, about the pigeons. I suspect the real reason everyone wanted to kill the pigeons had nothing to do with the disease carried. I live in an apartment building. It is just, my balcony is constantly littered.

In any event, back to work. Dr. Barrett, this morning I heard on NPR a story about, which relates to what you are saying, about treating ADD, and that they found very frequently doing it without medication worked better as long as you, they say use the sorts of things you talked about. And so it is interesting to see that idea reinforced right here in your discussion. Just dealing with, and I wouldn't call it emotional literacy so much as just helping students cope with the real world, which is so different from their imagined world. So I thank you for reinforcing that.

I had one other question, which slips my mind at the moment, and so I will simply pass at this point. Thank you.

Chairman BAIRD. Dr. Lipinski.

Mr. LIPINSKI. I am sitting here, and I have somewhere else I was supposed to be at 11:00, but I couldn't drag myself away here.

So I am going to come back and ask everyone else. I asked Dr. Kenkel about his recommendations for what we should be doing in terms of funding and where we should be at, you know, funding for what research would be helpful. But I wanted to start out, you know, it can't be, we can't have some social scientists without having any questions about measurement and about variables.

I want to ask Dr. Koenig about, I know you are looking at a lot of different studies, but I keep coming back to you, how exactly do they measure whether, is this a dicogless variable, someone is religious or spiritual or they are not? Or is there a, you know, is this some sort of scale of how religious or spiritual someone is? That sort of thing really stuck out. I was wondering how is this, how is it usually considered?

Dr. KOENIG. There are many ways of measuring religious and spiritual involvement. There is a book called, Measures of Religiosity, that has literally hundreds of measures with psychometric properties, all in this one place. It is oftentimes measured by church attendance, which seems to be a proxy for level of involvement in religion community. It can be measured in terms of a very simple question of how important religion is to you: very important, somewhat important, or not important.

It can be measured with multi-item scales. There are many different scales. There is an intrinsic religiosity scale that has ten items that tries to capture to what extent the person's faith the object of their ultimate concern? Does it inform their decisions in life? To what extent does it direct their life and their life's decisions?

So there are measures of quantifying, and it ranges from 10 to 50, and you can then look at relationships with all sorts of mental and physical health outcomes.

Mr. LIPINSKI. So, obviously that is going to have a big impact on, well, the measure is going to be based on probably the theory of what the mechanism may be and then that is going to have a big impact. It is hard to bring all of those together and sort of make a summary and try to talk about mechanisms when you have all these different measurements that are out there. And I just want to throw that question out there. I am not trying to, you know, knock down. I just wanted to get some sense from you about that.

So let me turn back to the other question, if anyone else has any comments. Dr. Barrett.

Dr. BARRETT. Thank you very much. I have a lot of comments about this, so I will just try to keep it brief. I mean, I think that money, you know, investing money in individual labs or in research centers that tries to enhance social and behavioral research is great. You know, I work with economists. I collaborate with neuroscientists. I collaborate with neurologists, so creating spaces for people to have interdisciplinary discussions is great and important.

But I think that there are other ways in which the Federal Government can invest that are really important and are lacking. For example, just having a well-trained, well-educated workforce, scientific workforce, we no longer really have that anymore in America. Most of the people that I know and this is also true for my own lab, have difficulty getting the post-doctoral fellows that we need to work on research projects, whether it is within a discipline or across disciplines, from the United States.

Right. I just recently hired four post-doctoral fellows, one of whom is from the U.S., and one is from Japan, and one is from China, and one is from France. Now, I am all for diversity, and I think it is wonderful, and I am not, you know, saying that we shouldn't have these kinds of collaborations across boundaries, national boundaries, but we really, there are just not enough people who are trained. There are not enough people who are trained within a discipline, let alone to be able to cross disciplines easily. And we don't pay people sufficiently so that the best minds come to science instead of going into finance, although the current situation might change things.

But, you know, in addition to which I think some of the, there are real technological issues that have to be addressed that will allow basic social and behavioral sciences to interface with other disciplines, let us say for example neuroscience. So right now if you are interested in understanding how the brain creates behavior, you can measure behavior outside a scanner and then you put somebody into a, you know, a scanner that will image their brain where they have to lie completely and utterly still. Right. You can, and you can get really good measure of where neurons are activating in the brain, but you can't measure the time course of the activation. And it turns out that, you know, it, the brain, neurons don't turn on and off like light switches. There is this constant, you know, over milliseconds the pattern of neuronal activity changes, and these, you know, millisecond to millisecond changes are really

important for understanding how the brain is producing particular behaviors.

So these are challenges that, you know, our country faces if we want to move forward in a significant way, and I would also point out that, you know, I live in Boston, where there are a total of 12 research magnets that can do neuro-imaging, and there are, you know, I don't know, probably a thousand people who do research on this topic where they are trying to understand how the brain produces behavior. And there is very little access, you know. Even at an institution where, you know, there, I have a lot of federal funds and people's desire to be helpful, I have trouble actually getting access to the machinery that I need.

So it is not just about funding labs. It is about creating a workforce and creating the tools, and I think we have a lot of work to do on both of those fronts.

Mr. LIPINSKI. Anyone else have any, want to add anything?

Dr. JEMMOTT. I would like to add something with regard to the area of HIV. I think there are three different things that are needed. One is more research on dissemination. We have been conducting HIV prevention research for quite a while in the United States, and we have a large number of efficacious interventions, but yet we are still seeing very high rates of HIV.

And part of the problem is that these efficacious interventions are not being used in the community. And so we need to understand why. We have to understand why interventions are adopted and why they are not adopted. We need more research on that.

We need more research on how a community can take an intervention and adapt it so that it is more suitable for their population, and that will include an understanding of what are the critical ingredients of an intervention that cannot be changed and which things can be changed.

And then the third thing is to look at the issue of the effectiveness of the intervention when it is outside of sort of the social science laboratory where you have highly-trained facilitators, and it is very tightly controlled. In a real-world environment is it still going to be effective and what are the factors that determine whether it is going to be effective in those settings or not. So that is a whole area, dissemination.

The other thing I would say is even though we have a lot of interventions, we don't have interventions for one critically-important population, and this is the population that is the population that is the highest-risk population in the United States. It is African-American men who have sex with men. They have rates of HIV that rival those that we see in sub-Saharan Africa. And yet to this day we still don't have an intervention for them that is based on a randomized, clinical-controlled trial. So we need more research on that.

And then the third thing I would say is a controversial area that has come up, and that is the issue of abstinence only. We are spending tremendous amounts of money for abstinence only programs, but the data are just not there. We have a lot more data on efficacious, sort of comprehensive education programs. Where on abstinence only there is hardly any. And I believe that it is possible to develop abstinence-only interventions that can be efficacious, but

the problem is there is not much research going on right now on that issue. So there really needs to be a lot more research on abstinence-only interventions, especially given that they are so widely used and so widely encouraged.

Mr. LIPINSKI. Is there a reason there isn't that research, abstinence-only?

Dr. JEMMOTT. I think that most researchers haven't really been interested in it. They are of the mindset that, you know, young people are going to have sex. It is impossible to get them to stop. I think that is probably part of the reason. Some people promote abstinence from a religious perspective, and many researchers are not very religious, you know, so that is not going to motivate them to promote abstinence.

So it is not seen as an efficacious strategy, but it actually hasn't been tested very rigorously.

Mr. LIPINSKI. Thank you. Dr. Koenig, anything to add there if the Chairman will allow?

Dr. KOENIG. Yes. I appreciate exactly what you are saying, particularly about the fact that scientists are not very religious, and so when you are looking at the NIH or the National Science Foundation, you are looking at review sections that are made up of scientists who are in many respects biased against any traditional form of religious practice or activity. If you have a kind of a new age spirituality or a fringe area of alternative or complimentary medicine, they will fund those in a heartbeat. But if you even mention the word of God or anything related to God, it, immediately it turns sour. So I think in some respects making some interventions in order to overcome some of the bias on the review sections at the NIH and at NSF would be very helpful.

Also, having awards or having programs where you train young investigators or senior investigators to conduct research in this area, provide them with the expertise to conduct the research. I think that would have big payoff in terms of them being able to write adequate grants that are competitive for funding.

Mr. LIPINSKI. Thank you.

Chairman BAIRD. I will recognize Dr. Bartlett. I would just note, though, in the context of this discussion, the vast amount of federal money that has been going towards abstinence-only education based on scant research. We tend, and when Dr. Ehlers was saying earlier, a little bit too much, in my judgment, of this argument that there is an anti-religious sentiment certainly in the Presidential debate of late, and always the religious factor plays heavily. And I would say the abstinence-only advocacy and the vast funding that is going towards it in this country and internationally is driven not based on empirical basis but based on religious belief.

And so on the one hand to say, well, we discriminated against religion in our scientific practice, and yet we mandate taxpayers to fund an intervention strategy that has at present relatively scarce demonstrated efficacy but is driven by a largely philosophical/religious. And then so we mandate that funding but then we say there is an anti-religious bias. That is a bit inconsistent. I would just, for the record suggest, and while we ought to study the efficacy, if those studies of efficacy give us differential results, we might want to modify our policy in some way, and that is a difficult thing. If

the basis for the policy advocacy was not an empirical position but an ideological one, that is a challenge for us.

Dr. Bartlett.

Mr. BARTLETT. Thank you very much. Dr. Kenkel, you mentioned that half the deaths in our country come from tobacco, sedentary lifestyle, and obesity. One would suspect a cause-effect relationship between the last two of these. I think some very bad trends started in our country when the economy and keeping up with the Jones drove the mother out of the home, into the workplace and replaced her with the television set.

The first thing that happened was that there is a very positive relationship between the number of television sets in the country and the degree in SAT scores over 24 years. They still rattle around in the basement, and they are not coming. They are not coming up. Of course, as the kids sat in front of the television set and nibbled on fast foods, obesity became a problem.

I understand that the next generation of Americans for the first time ever may live less long than this generation, primarily because of obesity. I tell audiences, this is a really great country we live in. The biggest health problem of our poorest people, those on welfare, is obesity. Now, isn't that a great country? That is really sad, isn't it, that we have that relationship.

When you ask Americans do you think your kids are going to live as well as you lived, and a vast majority of them say, no. And when you ask people, do you think your country is on the right track or wrong track, more people than ever in our history today think that their country is on a wrong track.

What can we in Congress do about these things? Which is why we are here today. Let us just start with Dr. Barrett. If you have a comment on the last exchange, I would be happy to have that, too.

Dr. BARRETT. I have comments on almost every comment that has been made. I am trying to sit here and not make them. I would suggest, I mean, the comment that you just made, you know, it seems to me that the fact that obesity is a major health challenge in the United States and that the children, our children are not going to live as well as we do may have something to do with the fact that mothers are no longer at home or the fact that fathers don't stay home.

But it also has to do with the fact that if you walk into a supermarket, you, you know, there is a very narrow strip of fresh fruit at one end, and at the other, and the rest of the supermarket is filled with things that are bad for you.

And my understanding from, you know, scientists who study, social and behavioral scientists who study obesity is that this problem has a lot to do with the fact that, the way that food is marketed, what food is available, and the fact that carbohydrates apparently, you know, which are very, you know, very bad for you, you know, actually trigger the same kind of process as an addiction to other kinds of things that are bad for you.

So it seems to me that this example is an example of a problem that isn't going to have a quick fix, that there are multiple causes and multiple factors that need to be addressed and that there is not going to be any single kind of quick fix, which I think brings

to the forefront the point that a lot of us have been making today and that I think is a sympathetic, people are sympathetic to, and that is that, you know, sciences have to work together, no science can solve the problem. Right. There is not going to be a pill that, you know, solves, that cures obesity. You are not going to find a gene that cures obesity. It is not going to just be providing people with cheap, you know, produce that will, you know, cure obesity. I mean, none of those things in and of themselves are going to solve that particular problem.

I would say that I think as a general rule one of the reasons or at least what I see is that this is a country that is anti-intellectual compared to other countries but doesn't understand science. It doesn't, really deeply just does not understand the value of science for producing better outcomes in life. And some of that has to do with education and, you know, at all levels, just, you know, how well do we train our students about science, how well do they understand what science can really do for you?

Some of it has to do with, you know, actually what I have been hearing today a little bit, which is, you know, I have to disagree, Dr. Koenig. I sat on review panels, grant review panels for the past 10 years. I sit on the editorial boards of almost every major psychology journal in my field, and I have never seen bias against questions of religion. What I do see is what I also see here today, which is that all of us are the product of the Enlightenment. You know, we are all the product of the belief that faith is something different than reason, that reason has, it is not Freud's fault. I mean, a lot of things are Freud's fault, but that, this isn't Freud's fault. I mean, you know, it goes all the way back to Descartes and even further, that, you know, we believe that reason is something different than faith, that cognitive things, you know, that we could solve the current economic crisis by looking at cognitive mechanisms, when, in fact, we know that within the brain cognition and emotion are intimately entwined and that some of the things that Canaman and Diversky discovered are actually emotional effects, that, you know, we just, we don't, that we use these kind of common sense beliefs in the kinds of questions we ask and the kinds of things that we fund, and it has consequences in, for, you know, in the end, for the outcomes of our children.

Mr. BARTLETT. Mr. Chairman, thank you very much for a good hearing, and thank you, panel. What we really need, of course, is a cultural change, a culture gets what it appreciates. You might ask yourself how often does the White House invite an academic achiever there to slobber all over them the way they do sports figures and entertainers.

Thank you very much for a good hearing, sir.

Chairman BAIRD. Thank you, Dr. Bartlett, for your insight.

We are almost finished, but if there is any final comments anyone wants to make, I would like to open that up very briefly. We don't have—Dr. Koenig.

Dr. KOENIG. I have actually a comment with regard to Mr. Bartlett's question about obesity future lifespans.

You know, it is interesting that the demographic that you are talking about with the highest rates of obesity is also the same demographic that has the highest rates of religious attendance. These

people are at all ages in churches, half of them, more than half every Sunday. So what a marvelous place potentially to take advantage of some of this science that, with regard to health education within churches concerning diet, concerning exercise, concerning lifestyle changes.

And you cut your populations right there. How can you motivate churches to develop these faith, health ministries where they address these issues in the congregation that could extend longevity, that could reduce the need for health services. Religion and medicine and health care are parallel ways of enhancing health in many respects, but they are just not communicating.

Chairman BAIRD. Dr. Kenkel.

Dr. KENKEL. Actually I would like to also say something very quickly, and I think it actually compliments several of the other comments here about the role of information as providing consumer incentives. We, and how that could play out with obesity and perhaps, you know, with the religion education or with various other dissemination of information.

And I was struck a few years ago when the Atkins Diet came out how quickly all of a sudden there were all sorts of low carb products just all over the place. And this is an example of, you know, the economist sees this as an example of how the market responds with what consumers want. What happens, though, is we have to be sure that the consumers get the information that helps them want healthy things.

And one of the comments made earlier by Mr. Bartlett was that the high prevalence of obesity among low socioeconomic status, you know, among the poor, that is also very true for smoking, and we are coming up with a situation where, you know, increasingly some of these big health problems like obesity and smoking and others are really confined to people with low education, low income, and at the same time for people at the higher incomes who have access to all these great products and all the great information, we can become increasingly healthy.

And so this, a lot of interest in disparities in health linked to these kinds of behaviors and trying to figure out interventions, again, that could help eliminate those disparities and motivate people that are, the groups that are in the most need of getting this information to use these new products I think is a very exciting area for public policy and research.

Chairman BAIRD. It has interesting foreign policy implications in the developing world we have gone in many cases, there is still starvation, but in many developing countries we have gone from the leading death cause is not starvation but the non-communicable diseases like diabetes, obesity, cardiovascular, and things.

Dr. Jemmott, did you have a final comment?

Dr. JEMMOTT. I would just say that I agree that we should focus on obesity and sort of food consumption, nutrition, et cetera, but I think we should also remember that physical activity is very important as well. And I think a lot of Americans know a lot about, you know, food and what they should eat and shouldn't, and should not eat, but when it comes to physical activity, they don't know how they can fit it into their daily routine, yet it is so important.

So it seems like we need to have more focus on that as well.

Chairman BAIRD. Again, I thank the panelists and the folks in attendance today. Thank my colleagues. With that the hearing stands adjourned. I am grateful for your presence. Thank you.

[Whereupon, at 11:45 a.m., the Subcommittee was adjourned.]

Appendix:

Additional Material for the Record

STATEMENT OF DAVID B. ABRAMS
EXECUTIVE DIRECTOR
THE STEVEN A. SCHROEDER INSTITUTE FOR
TOBACCO RESEARCH AND POLICY STUDIES
AMERICAN LEGACY FOUNDATION®

There is strong evidence that half of all deaths in the U.S. can be attributed to behavioral factors such as smoking, poor diet, overeating, and physical inactivity. In addition, behavioral and social factors contribute to the staggering costs of preventable morbidity and mortality.

Even with the dramatic contributions that behavioral and social sciences research has made to date, much more needs to be done to understand the role of behavioral and social factors in disease and, in turn, to use that knowledge to improve the Nation's health.

Behavioral and social sciences research is critical to improving public health overall, but is especially important in addressing youth smoking prevention and adult tobacco cessation. Tobacco use is the single most avoidable cause of disease, disability, and death in the United States. Eighty percent of all smokers have their first cigarette before age 18 and 90 percent start smoking before age 20. Within days or weeks of smoking your first cigarette, symptoms of nicotine dependence may appear. Although nearly half of all smokers attempt to quit each year, less than five percent are successful, with the majority going back to smoking within just seven days.

As we examine how to reverse the tobacco epidemic in this country, we must pay special attention to the role of behavior change. Young people are especially vulnerable to the advertising tactics of the tobacco industry and their power to affect behavior is undeniable.

Last month, a new report from the National Institutes of Health, Monograph 19: *The Role of the Media in Promoting and Reducing Tobacco Use,* concluded that much tobacco advertising targets the psychological needs of adolescents, such as popularity, peer acceptance and positive self-image. Advertising creates the perception that smoking will satisfy these needs.

The report also concludes that mass media campaigns can reduce smoking, especially when combined with other tobacco control strategies, lending further credibility to existing media campaigns that have been proven to curb youth smoking, such as the American Legacy Foundation's award-winning **truth**® campaign. In its first two years, **truth**® was credited with 22 percent of the overall decline in youth smoking, but the annual budget for **truth**® is less than the $36 million our competitors in the tobacco industry spend in just 24 hours to market their deadly products to consumers in the U.S.

Behavioral and Social Sciences have also provided effective smoking cessation treatments for tobacco dependence as well as for other addictions and mental illnesses like depression and anxiety. The national smoking cessation campaign called **EX**® is geared to taking what we know and reaching the 45 million current smokers—the majority of whom want to quit, but have not accessed the available effective resources in previous quit attempts. Despite the concerns of the obesity epidemic and the escalating costs of health care, we should not forget that tobacco use is still the single biggest preventable cause of death, suffering and excess cost to our health care system.

Investments in behavioral and social sciences have paid off. We have contributed to child health and human development, to improving quality of life as we age, and we have cut HIV–AIDS incidence in half in less than 20 years, and many other examples, using principles and practices of Behavioral and Social Science. We know a great deal about how to reverse the type 2 Diabetes epidemic. However, putting what we know into practice and policy has fallen far short of what is needed and could be achieved to improve our nation's health. If we put all of what we know in behavioral and social sciences into practice and policy at every level of health care and public health delivery, we could dramatically reduce chronic disease burden, disability, death and huge preventable expenses to our nation. We can do this with what we know today.

Despite considerable success over the past decade in tobacco control, tobacco use still accounts for nearly one-third of cancer deaths in the U.S. and worldwide, and tobacco-attributable mortality is predicted to increase in the coming decades if current smoking patterns continue. Tobacco use is also a major contributor to heart disease, pulmonary disease and it complicates and makes worse almost any other disease. If this trend is to be reversed, an in-depth understanding of the behavioral and social factors that underlie tobacco use as well as effective prevention and treat-

ment efforts must inform the debate and guide the way to effective policy changes. Behavior change is at the center of the translation of new discoveries in the biomedical, socio-behavioral, and population sciences into practices and policies to improve our nation's health.

The Steven A. Schroeder National Institute for Tobacco Research and Policy Studies at the American Legacy Foundation® advances the science behind social marketing, smoking cessation and tobacco control policy to facilitate the translation of empirical findings to practical public health interventions. The American Legacy Foundation is dedicated to building a world where young people reject tobacco and anyone can quit. Located in Washington, D.C., the Foundation develops programs that address the health effects of tobacco use, especially among vulnerable populations disproportionately affected by the toll of tobacco, through grants, technical assistance and training, partnerships, youth activism, and counter-marketing and grassroots marketing campaigns. The Foundation's programs include **truth**®, a national youth smoking prevention campaign that has been cited as contributing to significant declines in youth smoking; **EX**®, an innovative public health program designed to speak to smokers in their own language and change the way they approach quitting; research initiatives exploring the causes, consequences and approaches to reducing tobacco use; and a nationally-renowned program of outreach to priority populations. The American Legacy Foundation was created as a result of the November 1998 Master Settlement Agreement (MSA) reached between attorneys general from 46 states, five U.S. territories and the tobacco industry. Visit *www.americanlegacy.org*.

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