

IOM President Discusses “Paradox of Prevention” At Hopkins Grand Rounds

If prevention is such a good idea, why aren't we getting more of it?

That's the provocative question posed by the Institute of Medicine's Harvey Fineberg at Preventive Medicine Grand Rounds at Johns Hopkins School of Public Health in early April. Fineberg posed his question after hearing from the audience why prevention is a core tenet of public health. Among the reasons given were that prevention is better than

cure, it adds quality of life, is easier to accomplish than cure, and is often cheaper.

Fineberg himself made the case for prevention by noting that life expectancy in the US increased from less than 50 years at the beginning of the previous century to greater than 75 years by the year 2000 because of preventive interventions such as

-IOM continues on page 2

Reporter Says Morgan Defense Of Pat Buffler Takes Us Back To Square One In Ethics Debate

Do You Agree Or Disagree?

The Monitor To Offer Readers An Ongoing Forum To Discuss Ethics Issues

[Editor's Note: A commentary by Robert Morgan in the March 2014 issue of The Epidemiology Monitor defending the work of Pat Buffler has elicited a detailed response from David Heath, the investigative reporter from the Center for Public Integrity who wrote the original revelations about Buffler. The commentary by Heath concludes that Morgan does not advance the dialogue about scientific integrity and

how best to address conflicts of interest.

In an effort to move the conversation beyond square one, the Monitor is launching an ongoing forum to discuss ethics issues in epidemiology. Such a forum is needed, according to our sources familiar with challenges in ethics. Readers interested in helping to edit this new forum or *- Heath continues on page 9*

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Marketplace

**April
2014**

**Volume
Thirty Five**

**Number
Three**

The Epidemiology Monitor
ISSN (0744-0898) is
published monthly
(except August) by
Roger Bernier, Ph.D.,
MPH at 33 Indigo
Plantation Rd, Okatie, SC,
29909, USA.

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vaccines, sanitation, and safer food
and water. These account for two
thirds of this increase, and the
evidence for the payoff from
prevention is overwhelming, he said.

Hard Sell

So, if prevention is so compelling
conceptually and empirically, why is
implementation such a hard sell?

The obstacles to implementing
prevention on a wider scale are not
unfamiliar to a public health
audience. Fineberg first offered his
own list of reasons in a paper in
JAMA in July of last year and
repeated many of these ideas at the
Hopkins Grand Rounds this month.
(Fineberg H The Paradox of
Prevention Celebrated in Principle,
Resisted in Practice JAMA 2013: 310
(1); 85-90)

Obstacles To Prevention

Key obstacles to practical acceptance
of prevention are:

1. Success is invisible, that is, when
prevention succeeds it creates an
absence of events. We count what
occurs, not what does not, said
Fineberg.
2. Given this lack of events, there is
an absence of drama associated with
prevention. Tragedy that is avoided
is not considered.
3. Prevention success is about
statistics, and statistical lives saved
have little emotional effect even
though there is a story, or even a tear
behind each number, according to

Fineberg.

4. The rewards of prevention are
delayed and not tangible in the here
and now. Most people want quick
fixes such as those often associated
with surgical interventions.

5. Benefits do not always accrue to
the insurer or payor for the
prevention activity. The incentives in
a system such as ours are to treat
people. They are not aligned with
activities designed to eliminate the
need for treatment in the first place.

6. Preventive advice changes as we
learn more, and this appears
inconsistent to the public. Fineberg
used the example of mammography
screening guidelines for women
under 50 to make this point. He said
that the guidelines which changed
the existing recommendations were
not aptly interpreted and proved
confusing to the public.

7. Behavior changes tied to
prevention often require
implementation over long periods,
and this is difficult to accomplish. He
quoted Mark Twain who said
quitting smoking was easy since he
had done it hundreds of times.

8. Individuals have a bias against
adverse consequences due to action
compared to those following natural
causes (errors of commission). In
clinical medicine, the bias is more
against errors of omission.

9. Many accept preventable harm as
normal because it exists and may be
commonplace. However, what is
truly normal or the "right number"

-IOM continues on page 6

Shared Beliefs And Ideals For All Medical Disciplines Are Needed, Suggests IOM Workshop

Articulating A Unified Code Of Ethics Seen As A First Step

New Mechanisms of Enforcement Also Recommended And May Apply To Epidemiology

Prompted by desires to respond to changing expectations in society that call for more patient autonomy, transparency, and cooperation between medical professionals and by increasing conflicts of interest as commercial interests penetrate more of medicine, a workshop was held recently at the Institute of Medicine entitled "Establishing Transdisciplinary Professionalism for Improving Health Outcomes." This type of professionalism is defined as an approach to creating and carrying out a shared social contract that ensures multiple health disciplines, working in concert, are worthy of the trust of patients and the public."

New Ethos

The discussions taking place at the workshop at the Institute of Medicine have highlighted the need for all health professionals to commit to a shared set of guiding beliefs and ideals and to articulate these in a unified code of ethics across all of the medical professions. These discussions have been summarized in the just released workshop report from the Institute of Medicine (1) and in a paper published by [Matthew Wynia](#) and colleagues in JAMA entitled "A Unified Code of Ethics For Health Professionals – Insights From An IOM Workshop".(2)

Professionalism

In its discussion of professionalism, the

workshop summary begins with a quote from [William Sullivan](#) in 1995 "neither economic incentives, nor technology, nor administrative control has proved an effective surrogate for the commitment to integrity evoked in the ideal of professionalism. Some notions of professionalism are about the actions and acts of individuals but could also be more about collective responsibilities for a profession as a whole, according to the IOM summary.

In the IOM report's section on trust, Wynia defined professionalism as the process through which a profession becomes worthy of the trust of patients and the public. He notes that this trust can be earned by putting forward a set of practice standards, making the standards public, and listing the standards as specific behaviors to which the health professions will then hold themselves accountable.

Public Engagement

At the workshop, Wynia posed the question---What is a legitimate way to establish professional standards for practice and shared values that incorporate the voice of the public and individual patients? There appeared to be about the importance of bringing the community into the

"...neither economic incentives, nor technology, nor administrative control has proved an effective surrogate for the commitment to integrity evoked in the ideal of professionalism."

"What is a legitimate way to establish professional standards for practice and shared values..."

- Beliefs continues on page 4

conversation about professionalism with suggestions that such community engagement is taking place already in countries such as the UK and Canada.

“...my personal view is that the ethics of public health and that of medicine aren't very far apart...”

More Than Just A Code

As stated in the JAMA summary, however, development of a code is considered insufficient to maintain public trust. New mechanisms for the development and enforcement of this unified code, and for the engagement of the public in developing the new code, are also called for. While the code and other changes are being recommended in the context of medical care, Wynia told the *The Epidemiology Monitor*, “...I agree that the social obligations of those who serve primarily populations is complex and can be quite challenging. Still, my personal view is that the ethics of public health and that of medicine aren't very far apart, despite the apparent differences.”

Reporting Requirements

When asked about conflicts of interest, Wynia noted the importance of disclosure and transparency. He stated that the Affordable Care Act has a provision that requires manufacturers of drugs, medical devices and biologicals to report certain payments and items of value given to physicians and teaching hospitals. Given recent revelations about failures to disclose conflicts of interest in epidemiology, a requirement for epidemiologists to

report payments for consultant services is a possible approach to addressing conflicts of interest to assure full disclosure.

Editorial

A strong editorial about the need for transparency in translating science in the modern world appeared recently in *Environmental Health* triggered by failures to disclose conflicts in the toxicology community. According to [Philippe Grandjean](#) and [David Ozonoff](#), “Although remedies exist to close a widespread credibility gap with industry-sponsored research, they are meaningful only in connection with transparency.”

References

1. Establishing Transdisciplinary Professionalism for Improving Health Outcomes: Workshop Summary

<http://tinyurl.com/kzpkfk6>

2. Wynia, MK. A Unified Code of Ethics for Health Professionals. Insights from an IOM Workshop. *JAMA* 2013; 301; 799-780

■

“Although remedies exist to close a widespread credibility gap with industry-sponsored research, they are meaningful only in connection with transparency.”

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Cardiovascular Disease Epidemiologist Awarded \$60K Fries Prize For Improving Health

“Death is inevitable, but premature death is not.”

Charles Hennekens, a cardiovascular disease epidemiologist and co-author of the book *Epidemiology In Medicine*, received the Fries Prize in early March 2014. Hennekens was honored for his discoveries of the benefits of aspirin, as well as his work on statins, angiotensin converting enzyme inhibitors, angiotensin receptor blockers and beta adrenergic blockers. These drugs are now cornerstones in the treatment and prevention of heart attacks and strokes, according to the press release from the CDC Foundation which awarded the prize on behalf of the Fries Foundation.

Background

Hennekens is the first Sir Richard Doll professor and senior academic advisor to the dean in the Charles E. Schmidt College of Medicine at Florida Atlantic University. He was the founding principal investigator of the Physician’s Health Study, which was the first to show that aspirin prevents a first heart attack and the Women’s Health Study, which was the first to show that aspirin prevents a first stroke. In addition, he was the first to demonstrate that aspirin given to a patient within 24 hours after the initial symptoms of a heart attack reduces the death rate as well as further prevents heart attacks or strokes. He also demonstrated similar benefits of aspirin given to patients who survived a blockage in the heart, brain or legs. Science Heroes ranked Hennekens #81 in the history of the world for having saved more than 1.1 million lives, according to the press release.

Comments

“When you consider the medical discoveries of the past century, among the most important is Dr. Hennekens scientific proof of the benefits of aspirin to prevent heart attacks and strokes,” said James F. Fries, retired Stanford University professor of medicine and chairman of the James F. and Sarah T. Fries Foundation, which awards the annual Fries Prize for Improving Health. “His discoveries have both improved and saved the lives of millions of people who follow the preventive guidelines now put into practice by doctors around the world.”

“I am humbled and honored to receive this prestigious award from the Fries Foundation,” said Hennekens. “This award is especially meaningful to me as my chief motivation to pursue an academic career in preventive cardiovascular medicine was the premature death of my beloved father from sudden cardiac death when I was 17. I am inspired by Jim and Sarah Fries for their commitment to reducing premature deaths and suffering in the United States and worldwide. To paraphrase my mentor, colleague, and friend, Professor Sir Richard Doll, ‘death is inevitable, but premature death is not.’”

-Fries Prize continues on page 6

“His discoveries have both improved and saved the lives of millions of people...”

“...my chief motivation to pursue an academic career in preventive cardiovascular medicine was the premature death of my beloved father...”

Why The Prize

First presented in 1992, the Fries Prize for Improving Health recognizes an individual who has made major accomplishments in health improvement with emphasis on recent contributions to health in the United States, and with the general criteria of the greatest good for the greatest number. It is intended for an individual who has done the most to improve health. Fries Prize recipients are awarded \$60,000.

The Foundation

The James F. and Sarah T. Fries Foundation is a nonprofit corporation incorporated in 1991. The mission of the Foundation is to identify and honor individuals, organizations, or institutions which have made great contributions to the health of the public. The Foundation seeks to reward accomplishment rather than promise, practicality rather than theory. For more information on the Fries Foundation, visit:

<http://tinyurl.com/lutfsmb>

For more information on the Fries Prize, visit:

<http://tinyurl.com/mo82jsl> ■

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of occurrences may be quite different. For example, the right number of murders is zero, said Fineberg.

10. A double standard is used in evaluating prevention compared to treatment. We require that preventive measures be cost saving when in fact we should be prepared to pay for whatever the benefits of prevention are even when above zero cost.

11. Financial conflicts of interest can occur when financial interests are not aligned with prevention activities. In this situation, conflicted persons can fail to perceive the virtues of a preventive approach. Commercial interests can elevate doubt to forestall preventive action, said Fineberg.

12. Conflicts with personal, religious, and cultural beliefs also inhibit the adoption of preventive measures. He gave the example of condoms which can conflict with deep beliefs. Fineberg said success in communicating with the public about prevention should focus not on providing new information but instead on linking prevention activities or concepts to existing interests and values on the part of the public.

Strategies For Enhanced Prevention

Fineberg offered the following strategies to help prevention become more fully integrated into our culture.

1. Pay for prevention. He cited the example of the Affordable Care Act which seeks to put prevention on a par with treatment.

“...the right number of murders is zero...”

“A double standard is used in evaluating prevention compared to treatment.”

More Humorous Marriage Vows Submitted In Contest Time Remains To Enter Competition Before April 30 Deadline

Our last invitation to enter the double entendre marriage vow contest appears to have struck the humor vein among epidemiologists. We knew it could be found with a little coaxing! A large number of new entries have been received and we look forward to more. Use your imagination and creativity and earn the \$500 first prize.

To help inspire you, here are some of the latest entries. These are some of the ones to beat! Readers are invited to submit as many entries as they wish. Send entries to: epimon@aol.com

Latest Marriage Vows For Epidemiologists

"I promise to always see you as significant, but maybe I'm just biased."

"I promise to never over-analyze you when you are scattered or skewed."

"These vows cause us to be correlated until mortality disperses us."

"I promise that you will always take my breath away, more so than a maroon Air Quality Index day."

"I promise to adjust all the confounders in our marriage to make us have a perfect goodness of fit."

"I promise that my love is like a perfect trial: 100% adherence and no lost to follow up."

"I promise to stratify your good and not so good qualities."

"I promise to control all confounders, including my displeasure, during our quarrels."

"Your association with me will result in nothing but synergistic love and bliss."

"I vow my love for you will be cumulative."

"I probably do, within certain limits."

"I promise you will always be my dependent variable."

"I vow that even when I don't feel normal and a little skewed, I will never be 'mean' to you!"

"I promise that you will always be highly significant to me, I am 95% sure of this!"

"I vow to never adjust or modify myself just to follow the latest trend!"

"I vow that I'll always call you beautiful, even if we're double-blinded."

"I vow to always keep you in my cohort."

"I vow that I'll always get informed consent."

"I vow that I'll never use you as my placebo control."

"I promise to control all confounders, including my displeasure, during our quarrels."

"I promise you will always be my dependent variable."

-Marriage continues on page 8

"I vow that, even if your requests are not specific, I won't be sensitive about it."

"I promise to never reject you, even if you spend my entire alpha savings on the first test."

"I vow that, even if your requests are not specific, I won't be sensitive about it."

"I promise to always show you sensitivity and be truly positive."

"I promise our interactions will always be significant and meaningful."

"To have and to hold, for better or worse, through case and control from this day forward"

"I promise that you'll always have the power to rule out all my explanations."

"I promise that I will always be sensitive, specific and rise to the gold standard."

"I take this step forward with confidence, significance and without regression."

"I vow to you that my love for you will have a 100% survival rate over a lifetime."

For additional contest information and a submission form please go to:

<http://tinyurl.com/l14ahe5> ■

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2. Make prevention cheaper than free, that is, give people financial incentives and pay them to take preventive measures.

3. Involve employers to come to understand prevention as a cost-effective investment in the workforce.

4. Reduce the opportunity for people to make decisions by engineering interventions so that they take place automatically such as air bags, and make preventive acts in general less burdensome.

5. Use policy to help people make good choices easier or less voluntary. He cited examples such as eliminating trans fats or reducing salt content in food.

6. Use multiple media channels to educate, reframe, and elicit positive change. We need to do a better job of explaining prevention to the population at large and connecting prevention to topics people already value, said Fineberg.

In closing, Fineberg called for the creation of a culture of health by all of the players in the health system. Modeling his idea on the successes in the advertising sector, Fineberg urged uncovering what is already in the mind of the public and tying prevention to these preexisting beliefs and desires. Success would mean that prevention messages become cultural norms and prevention is no longer the same hard sell.

■

-Heath continued from page 1

to contribute to it in other ways should write to us at epimon@aol.com.

We begin the forum with publication of Heath's response to Morgan. We are also publishing an article about the report of an IOM workshop calling for all medical professionals to hammer out a shared set of guiding beliefs and ideals to better address contemporary challenges to medicine and public health, including a unified code of ethics. This report has relevance for the situation in epidemiology.

Engage with the forum. Share your views with The Epidemiology Monitor and they will be published here.

The Heath commentary is presented below.]

Heath Commentary

Robert Morgan writes a provocative defense of Patricia Buffler that doubles as a defense of his own work as a scientist paid by industry.

He directly questions whether the source of research funding is relevant, proclaiming, "In science, the quality of the data and the validity of the criticisms are more important than authorship or funding... Scientific studies should be judged by the research design, data and interpretations, not funding."

Yet Morgan fails to adhere to his own standards in criticizing my work. He ignores the quality of my data, challenging instead my thoroughness, my motivations and even my funding. All of his suppositions about me and my work are off base.

He writes, for instance, that "Heath implies that Buffler's membership on the FMC Board of Directors was a shocking and secret conflict of interest," pointing out that FMC releases the names of its directors and even their compensation. "Hardly secret," he concludes.

I never implied that Buffler's role at FMC was secret to the whole world. To the contrary, I wrote that UC Berkeley officials were aware of it. The point was that neither Buffler nor the university disclosed this relationship when applying for government grants. FMC paid Buffler up to \$200,000 a year and gave her stock ultimately worth \$2 million. But none of this was disclosed when the university submitted the grant applications, even though the research involved investigating links between childhood leukemia and pesticides, including the type of pesticides FMC sold.

Morgan speculates that Buffler may have disclosed and I just missed it. He asks if I read her grant applications. I did, thousands of pages of them. On top of that, UC Berkeley officials confirmed the Buffler did not disclose her ties to FMC in conflict-of-interest forms federal rules require universities to maintain. Officials at the National Institutes of Health independently confirmed this. In my article, I quote the UC Berkeley vice chancellor saying that Buffler did not disclose.

Morgan then accuses me of hypocrisy: "Although [Heath] criticizes her funding, did he point out that his funding comes from an organization whose Board of Directors is chaired by a famous plaintiff's lawyer?" Again, I did. I work for a nonprofit investigative news organization that

-Heath continues on page 10

" Robert Morgan writes a provocative defense of Patricia Buffler that doubles as a defense of his own work ..."

"All of his suppositions about me and my work are off base."

" My article raises questions about the influence of industry funding on public-health science but it does not advocate a remedy."

discloses all of its funding and board membership on the same Web site where my stories appear. I don't know the board chairman. I have no evidence that he knew Buffler. He had no involvement whatsoever in this or any article I've written. Morgan doesn't explain why a lawyer who tries drug and medical-device cases would have any interest in Patricia Buffler.

Finally, Morgan writes that "Heath's apparent thesis is that industry should not fund health research." As the word "apparent" suggests, I never said this.

My article raises questions about the influence of industry funding on

public-health science but it does not advocate a remedy. In my interview with Epimonitor, I said that disclosure is a minimal step at addressing conflicts.

Whether any scientist -- subconsciously or not -- might be biased by his or her own financial considerations is a cause for concern. Scientific surveys suggest that research funding creates a bias that affects results. By dismissing this concern and questioning whether conflicts of interest even matter, Morgan takes us back to square one in the debate over scientific integrity.

David Heath
Center for Public Integrity ■

Sponsored Announcement

The Columbia Psychiatric-Neurological Epidemiology Early Career Award recognizes excellence by early career investigators in psychiatric and neurological epidemiology. This year the award was given to:

Dr. Olivia Okereke, Assistant Professor in Psychiatry at Harvard Medical School and in Epidemiology at Harvard School of Public Health is the recipient in psychiatric epidemiology. Olivia is a psychiatrist and epidemiologist whose work has been instrumental in identifying metabolic risk factors for dementia. She has lead or co-authored over 50 original papers, review articles, and editorials in the high impact journals. She received a K08 Career Development Award to extend her work in metabolic risk factors to modifiable risk factors such as diet and to identify novel biomarkers for dementia. She also received an R01 to conduct a randomized clinical trial for late-life depression prevention using long-term vitamin D and omega-3 supplementation. Her letter writer stated, "This is a first-of-its kind trial that is adequately statistically powered to simultaneous test all three modes of the Institute of Medicine framework of prevention: universal, selective and indicated . . . her work has earned national and international recognition."

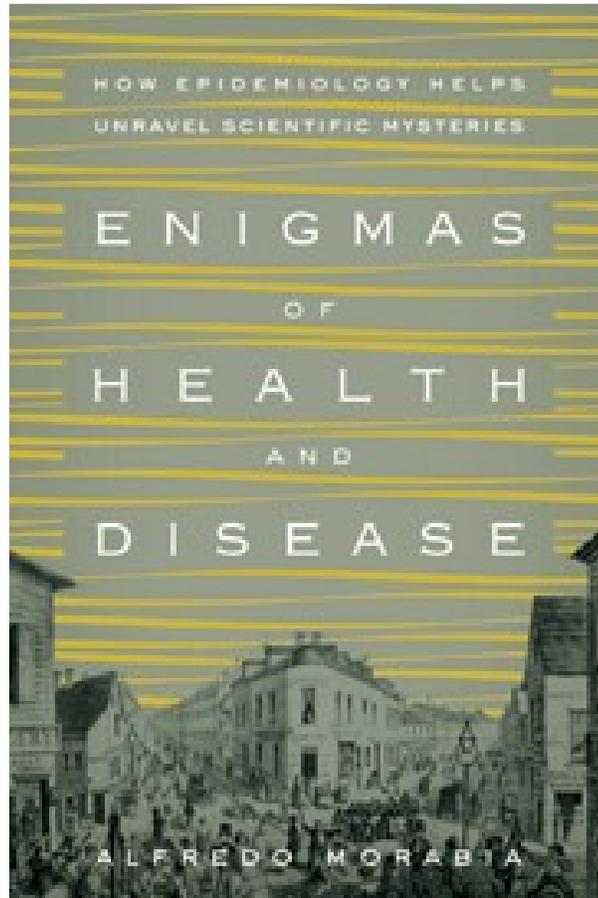
Dr. Christiane Reitz, Assistant Professor in the Department of Neurology, Sergievsky Center and Taub Institute and Department of Epidemiology is the recipient in neurological epidemiology. Christiane is a neurologist with a PhD in epidemiology/genetic epidemiology who has applied both traditional epidemiologic study designs and a variety of genomic methodologies to the identification of environmental and genetic risk factors underlying Alzheimer's disease (AD). She has lead-authored over 70 original papers, review articles, and editorials in the highest impact journals including JAMA, NEJM, and Stroke. She is the recipient of a highly prestigious NIH K23 Beeson Career Development Award and Co-Principal Investigator of an X01 award from the NIH/NHGRA to conduct a GWAS in > 3000 Caribbean Hispanics. Her letter writers stated, " Her research has already led to several major insights regarding both environmental and genetic risk factors for dementia . . . [Her] work led to the development of a risk score for the prediction of AD based on easily attainable risk factors . . . she is the perfect candidate for this award."

Book News

Free Sample Chapters of Upcoming English Edition Of “Enigmas of Health And Disease” Being Published in March and April Issues of The Epidemiology Monitor

An English edition of a 2001 French book targeted at meeting a public need to better understand epidemiology entitled “Sante: Distinguer croyances et connaissance” by Columbia University’s Alfredo Morabia has been adapted for publication as “Enigmas of Health and Disease”. The English edition is scheduled to appear in June 2014 and by special arrangement with Columbia University Press, the Prologue entitled “A Science Named Epidemiology” and a chapter entitled “Epidemiologic Literacy and ‘Earthly Self-Realization’ “ are being published in the March and April issues respectively of The Epidemiology Monitor. Readers interested in purchasing the book prior to publication may do so at a 30% discount by visiting the webpage for the book and using the promo code “ENIMOR”. The webpage is:

<http://tinyurl.com/lx4dvf8>



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Epidemiologic Literacy and "Earthly Self-Realization"

The year 2013 marked the two hundredth anniversary of the birth of John Snow, the London anesthesiologist who had the brilliant idea to compare the clients of two water companies in order to prove his hunch that the polluted water of the Thames, as was popularly believed, was responsible for the humongous cholera outbreaks of 1854 (see chapter 4).

Many reasons motivate epidemiologists to celebrate this achievement. Snow did not form his beliefs solely by chance: all sorts of evidence had already convinced him that cholera was a contagious disease. He was therefore prepared to seize the exceptional opportunity to determine whether the clients of a water company having moved its pumps to a clean place of the Thames would suffer less from cholera than those of the company that kept pumping its water in the center of London. He (personally) collected a mass of data, counted, compared, discovered what we know today as the right conclusion, and invited society to act. He incarnates a model epidemiologist.

The celebration in 2013 facilitated the opportunity to raise a question that has agitated the US Institute of Medicine and other similar institutions for many years now: When will epidemiology be integrated into the school curricula? One of the articles in a series published in *The Lancet* for that occasion stated: "Given the power of epidemiological methods in the assessment of human experience and endeavor, and its implicit role in so many discussions and decisions at the core of the everyday lives of all people,

"When will epidemiology be integrated into the school curricula?"

one might ask whether the subject should now be introduced as an obligatory part of the general science curriculum in secondary schools. We think so."

I think so, too. Note that the goal of epidemiologic literacy mentioned in this quotation would be to empower citizens for decision making at "the core of the[ir] everyday [life]." Indeed, the present time is opportune for generalizing basic epidemiology education. Current public trends demand it. There is an abundant search for health information on the Web. Roughly half of all adults between the ages of eighteen and sixty-four used the Internet to search for health information in 2009, according to a six-month study conducted by the US Centers for Disease Control and Prevention. Internet searches for health-related websites is such a common practice that they may even serve as sensitive indicators of emerging epidemics, a phenomenon National Public Radio has called "webidemiology." Millions of people simultaneously entering the same health-related keywords in their search engines may raise a flag before the cause of their concerns manifests into cases seen in emergency rooms and medical offices. This is a profound, international, new, and positive phenomenon: the emergence of an educated public that is thirsty for health knowledge.

How would understanding the principles of group comparisons change the way people search for health information on the Web? People would know how to separate knowledge from the mass of personal beliefs, opinions, and other unsupported theories that often bury accurate health knowledge. Moreover, a tremendous amount of anxiety and many unsafe decisions might be avoided.

However, as we have learned from our review of the history of epidemiology, there is an additional portentous reason for teaching epidemiology: there seems to be no other way to acquire its principles than by

" This is a profound, international, new, and positive phenomenon: the emergence of an educated public that is thirsty for health knowledge."

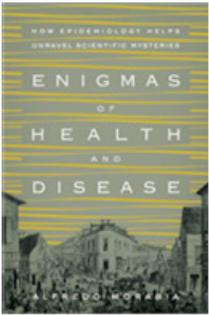
learning them. Thus, acquiring those principles is dependent on the incorporation of epidemiology into the formal school curriculum.

We have seen that it has taken a significant amount of time (at least 4,000 years) and scores of lost lives for society to develop a science of epidemics. It took an additional 350 years, since 1662, for medicine and public health to embrace epidemiology. Clearly, the union formed among society, epidemiology, and the latter's methods did not happen in an instantaneous "Eureka!" moment. It was an arduous process.

Even now that epidemiology has a presence in universities and in the media, not many people are familiar with it. Epidemiology is infamously arcane, even though, as this book shows, there is no intrinsic complexity to it. On the contrary, the principle of comparing groups of people involves no more than simple logic. Thus, we can wonder why people didn't rely on group comparisons to support the practice of medicine and public health before the end of the seventeenth century? Why did it take additional centuries for society to internalize epidemiology's methods, and why is familiarity with epidemiology still so uncommon?

Here is a plausible explanation: thinking in terms of populations is something human psychology struggles with. Apparently, no one spontaneously acquires the notion that risks are an attribute of populations and not individuals and that some health questions have exact answers for populations, but not for the individual. As stressed several times in this book, there does not seem to be a common life experience that teaches us the fundamental difference between an individual who is unique and whose health trajectory is unpredictable and a population or group of people whose health evolution can be predicted and compared. There is no historical evidence that population thinking is a skill acquired during the normal growth of intelligence. It takes some education. Pioneers of the discipline acquired it

"Epidemiology is infamously arcane, even though, as this book shows, there is no intrinsic complexity to it."



through self-learning. Reading the original prose of John Graunt (chapter 3), John Snow (chapter 4), Pierre Louis (chapter 5), and Adolphe Quetelet (chapter 4), to name only a few early population health scientists, reveals the elation engendered by their unexpected discovery of the regularity and predictability of traits in populations. The advantage today is that we can formally learn the concepts elucidated in this book from the lessons amassed by society over the past 350 years. The obstacle human beings face in becoming population thinkers might explain both the late genesis of epidemiology and society's slow acquaintance with it. This struggle is manifest in history, and it is obvious in classrooms.

Thus, to acquaint citizens with epidemiology, there seems to be no alternative than to teach epidemiology in middle and high schools, colleges, and universities as part of the basic education, along with public speaking, writing, math, and other sciences. It would also be possible, realistic, useful, and timely to integrate epidemiology into continuing education courses for adults. The outcome would be epidemiologic literacy, which will allow citizens to access and evaluate the explosion of health information available in mainstream publications.

Humans or Languishing Gods

Population thinking is – in my view – the most difficult concept that teachers have to transmit and students need to acquire. Population thinking is the most intellectually challenging component of epidemiology because it involves concepts, such as the concept of risk, valid for populations and not for individuals. Students have to learn to move back and forth between two universes governed by different rules. It is like learning to evolve in a fifth

"This abstraction makes epidemiology seem like an imprecise science"

dimension when our familiar world has only four (see chapter 1). Once this skill is acquired, the principles of group comparisons come naturally.

Risks are measured in populations. Consider (the realistic) lifetime risks of lung cancer as being 10 percent among ever smokers versus 0.5 percent among never smokers. These risks are tangible in a population of say 200 people: out of 200 lifelong smokers of at least one pack per day, 20 will get lung cancer; out of 200 lifelong never smokers, one will get lung cancer. But for an individual these risks are mere abstractions: we cannot say which individuals— John, Janet, Pierre, or Wade— will develop lung cancer over a period of time.

This abstraction makes epidemiology seem like an imprecise science, providing only half of an answer. A 10 percent lifetime risk is enormous, but it is not 100 percent. A 0.5 percent risk is much smaller, but it is not zero percent. For individuals, only certainties make immediate sense: "If I smoke, I will get lung cancer. If I do not smoke, I will not." In practice, these certainties do not exist.

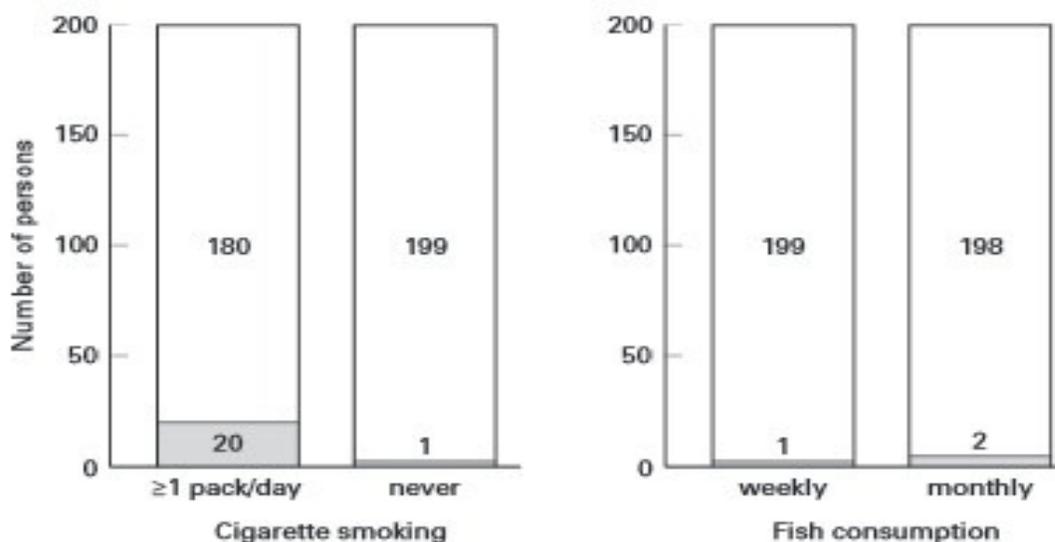
Errors of reasoning occur when the distinction between the two universes, that of the individual and that of the population, becomes blurred, when the difference between a 100 percent risk and a 10 percent risk is not properly interpreted. For example, I can think, "If I smoke, I will get cancer," but the proper interpretation of the 10 percent risk is: "If I smoke, I most likely will not get lung cancer." Similarly, it is inappropriate to equate a 0.5 percent risk among never smokers to a zero percent risk. I think, "If I don't smoke, I will not get cancer," but the proper interpretation is, "If I don't smoke, I am unlikely to get lung cancer."

This confusion happens all the time. Take for example the 2011 press release disseminated by many media claiming that "fatty fish" may cut risk of

" For an accurate interpretation of health risks, it can help to project ourselves as a unit of a population."

an eye disease called "macular degeneration." You can, as I did, informally inquire about people's reactions to it. Most of those who take the information seriously conclude that if they eat one or more servings of fish per week they will not get age-related macular degeneration. Others discard the information as implausible. Originally, the fatty fish-macular degeneration association is health knowledge. Misinterpreted, it becomes a belief.

For an accurate interpretation of health risks, it can help to project ourselves as a unit of a population. As a unit in a population of 200 smokers (see figure 15.1), if I smoke a pack per day, I might be among the 20 (10 percent) who will get lung cancer, or I might be among the 180 who will not. If I don't smoke, I can be the one who will get lung cancer in the group of 200 never smokers (0.5 percent) or among the 199 who will not. Ten percent and 0.5 percent are the population risks. I can subtract them and see that in the population smokers have 9.5 more percentage risk points of getting lung cancer than never smokers. This health knowledge can inform my individual decisions and help me choose whether to act, if this is within my wheelhouse, or to ignore it.



***"At first,
population
thinking is
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demands
practice"***

If you now apply the same reasoning to the risk of ocular macular degeneration, the interpretation of group comparisons to inform your individual choices should become even more evident. By looking further into the original scientific publication, you can learn that the ten-year risk is 0.5 percent for those who eat one or more servings of fish per week and 1 percent for those who eat less than one serving of fish per month. As a unit of a population of 200 people who eat fish weekly, I might be the one who will develop the eye disease over the next ten years, or I might be among the 199 who will not. If I eat fish less than once per month, I can be among the two who will get eye disease or among the 198 who will not. In the population, weekly fish eaters have 0.5 less percentage risk points for developing macular degeneration over ten years than the less than monthly eaters of fish. The intentionally inconspicuous difference between the dark sections of the two rectangles on the right of figure 15.1 is meant to translate graphically how difficult it can be to make sense of tiny risks for individuals. In comparison, the risk among smokers is huge.

Thus, risks are attributes of populations, not of individuals. Still, comparing risks can inform individuals about potential developments in their everyday life.

At first, population thinking is painful and demands practice. But once we become used to transitioning from the individual to the population level and vice versa, population thinking can be really cool.

For students who will still complain that they are not interested in uncertain knowledge, we can encourage them to consider the opinion of the novelist, playwright, and philosopher Jean-Paul Sartre, who held uncertainty as an essential characteristic of the human condition: "Living implies short-

term prediction and coping as best as we can. Maybe our fathers, with a little bit more science, could have understood that there was no solution to a given problem, that a question was poorly stated. But the human condition requires that we make blind choices: there is no morality without ignorance. If we knew all the factors that determine specific phenomena, if we were always sure to win, not only would risk vanish, but also courage and fear, expectation, final joy and effort; we would be languishing gods but not humans."

Wouldn't this be a great topic for a student essay in an epi class?

Epidemiology gives us access to a form of knowledge that may not be exact, but that is compatible with our human condition. It can inform our choices but not determine them.

"But the human condition requires that we make blind choices: there is no morality without ignorance."

Teaching in Schools

In 1987, the epidemiologist David W. Fraser stressed that epidemiology was a "low-technology" science readily accessible to nonspecialists, applicable to a broad range of interesting phenomena, emphasizing methods rather than arcane knowledge, and combining "the scientific method, analogic thinking, deductive reasoning, problem solving within constraints, and concern for aesthetic values."

He elegantly linked scientific method, problem solving, and aesthetics in a way that neither Sherlock Holmes nor Albert Einstein would refute.

The main question at this point is to choose an angle that makes epidemiology attractive to students. One option, as I have done in this book, is to take advantage of contextual aspects that can grasp the attention of even middle school students. The long voyages and naval battles of the ships of the

"Examples of group comparisons provide interactive ways to discuss the uses of epidemiology."

Royal Navy were propitious for scurvy and James Lind's trial (chapter 3). The epidemics of cholera investigated by Snow highlight the drinking-water crises that crippled bulging metropolises (chapter 4). Ignaz Semmelweis's tale puts the slow evolution of obstetrics in perspective at a time when giving birth was a major life threat (chapter 5). The life of cotton mill workers in small villages and of sharecroppers in the old cotton fields of South Carolina is the backdrop of Joseph Goldberger's elucidation of the link between poor diet and pellagra (chapter 6). And so on. Each of these tales remarkably addresses the main threats to people's health in the past. The solutions to these threats required courage, creativity, and the use of detective skills.

In high schools and (European) lyceums, it is possible to add some quantitative concepts such as risks, risk differences, and risk ratios to discuss health examples relevant to teenage life. The key questions to ask students are: "How do we know . . . ?" and "How can we know . . . ?" How do we know that contraception is safe, tobacco harms, addiction affects cognitive development, condoms protect against sexually transmitted diseases? How can we know whether usage of cell phones and laptop computers can impact health? The answers to all these questions invariably involve carrying out group comparisons such as those discussed in this book. Examples of group comparisons provide interactive ways to discuss the uses of epidemiology. These are only preliminary ideas, but I am confident that science teachers will have a better grasp of how to integrate this new discipline into their curricula.¹

"Earthly Self-Realization"

In a plea to make epidemiology accessible to senior citizens, allow me to take a very broad (but inspiring) perspective: the concept of "earthly

self-realization" proposed by the late historian Richard Fogel. It may seem like a long shot, but I believe the concept is highly relevant to this chapter's topic because having access to health knowledge can help individuals "realize" their full potential, culturally and physiologically.

Fogel first invokes the growing importance of leisure time in human life. After deducting ten hours for sleep, meals, and essential hygiene, there remain fourteen hours a day to spend doing productive activities. The fraction of these fourteen hours spent working to earn a living has declined from 80 percent in 1880 to 41 percent today. Fogel predicts it will shrink further to 25 percent by 2040.

His second observation is that the usage of free time has evolved. He attributes this evolution to a trend toward deemphasizing the pursuit of money and social status in favor of social life, cultural and spiritual values, and good health. Fogel cites a (now realization would still be, as Fogel puts it, "one of the fundamental driving forces of humanity, on a par with the most basic material needs."

More free time can mean more time spent traveling, exercising, and attending music and theater performances. These amenities of life are no longer solely reserved for the rich as they were only one hundred years ago. An important component of self-realization is the continuation of education beyond job training in order to better understand ourselves and the world we live in. And here is where epidemiologic literacy naturally chimes in.

Fogel was banking on a scenario in which a typical citizen would have more than fifty hours per week of leisure time before retiring at an average age of fifty-five and an additional thirty-five years of full-time leisure thereafter.² Clearly, the economic trends do not coincide with such optimistic assumptions.

*"...having access
to health
knowledge can
help individuals
"realize" their
full potential,
culturally and
physiologically.
"*

The current economic marasmus may cast doubts about whether resources will still be available to subsidize billions of person-years of leisure activity for people living on the margins of the labor market. It is beyond my expertise to tell whether Fogel's vision is irremediable. I hope that it is not, but even if it were only a remote perspective, it does not detract from the fact that self-realization would still be, as Fogel puts it, "one of the fundamental driving forces of humanity, on a par with the most basic material needs.

Health is a priority in the realization of one's self, and as Internet search trends have already shown, we can expect a demand for acquiring the basics of epidemiologic literacy in order to gain the skills needed to navigate the flow of accessible health information and better communicate with health professionals. Aside from the meeting of our personal interests, wouldn't society at large be better prepared to face acute health crises, such as epidemic threats, and to make key public-health decisions if it could count on the active involvement of literate in epidemiology citizens?

####



IEA World Congress of Epidemiology

17-21 AUGUST 2014
ANCHORAGE, ALASKA USA

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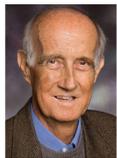
SPEAKERS



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PRESENTERS

OPENING PLENARY SESSION: CRUICKSHANK LECTURE



Tony (AJ) McMichael, MBBS, PhD

Emeritus Professor of Population Health at the Australian National University (ANU)

FEATURED PLENARY



Dr. Theresa Betancourt, PhD

Assistant Professor of Child Health and Human Rights in the Department of Global Health and Population at the Harvard School of Public Health



Paula Braveman, MD, MPH

Professor of Family and Community Medicine and Director of the Center on Social Disparities in Health at the University of California, San Francisco (UCSF)



Carlos E. A. Coimbra Jr., PhD

Professor of medical anthropology and public health at the National School of Public Health, Oswaldo Cruz Foundation (FIOCRUZ), in Rio de Janeiro



Sandra Eades, PhD

A Noongar woman from Mount Barker, Western Australia



Eric Fombonne, MD, FRCP

Professor of Psychiatry at McGill University and head of the Division of child Psychiatry

FEATURED PLENARY



Andrew Karanja Githeko, Ph.D.,

Pioneer scientist of the Kenya Medical Research Institute



Joachim F. Hallmayer, MD

University of Cologne, a postdoctoral fellow in the laboratory of Luigi L. Cavalli-Sforza, MD, in the Department of Genetics at Stanford



Miguel Hernan, MD, ScM, DrPH

Professor, Departments of Epidemiology and Biostatistics, Harvard School of Public Health



Richard J Jackson, MD, MPH

Professor of Environmental Health Sciences at UCLA School of Public Health and elected member of the National Academy of Sciences Institute of Medicine



Quarraisha Abdool Karim, PhD

An infectious diseases epidemiologist, a member of the faculty at the Mailman School, and an associate professor in Public Health and Family Medicine at the Nelson R. Mandela School of Medicine, University of KwaZulu-Natal, South Africa



Nancy Krieger, PhD

Professor of Social Epidemiology, Department of Social and Behavioral Sciences, at the Harvard School of Public Health

FEATURED PLENARY



Orin Levine, PhD

Leads the Bill & Melinda Foundation's efforts to accelerate the introduction of new vaccines and related technologies and to improve routine immunization systems



Shekhar Saxena, MD

Responsible for implementation of WHO's activities in the area of mental, neurological and substance use disorders.



Kirk R. Smith, PhD

A Professor of Global Environmental Health, and founder and director of the campus-wide Masters Program in Global Health and Environment at UC Berkeley



Kue Young, MD, PhD

Dean of the School of Public Health, University of Alberta, Edmonton, Canada

For a full list of all presenters, including featured symposia, go to:
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Opening for Cardiovascular Epidemiologist

The Knight Cardiovascular Institute (KCVI) founded in 2013 with a generous gift from Penny and Phil Knight (co-founder and chairman of *Nike*) is seeking a physician/scientist to develop a section on Cardiovascular Epidemiology at the Oregon Health and Science University (OHSU) in Portland, Oregon. The candidate should have national recognition as a physician-scientist and should qualify for position of Associate Professor or Professor at OHSU. Women and minority candidates are encouraged to apply.

OHSU is a Medical University comprising of a Medical School (oldest on the West Coast), University and Veterans Administration Hospitals, Dental School, School of Nursing, Vollum Institute for Fundamental Research, Oregon Clinical and Translational Research Institute (OCTRI), and the Oregon National Primate Research Center. The new recruit will be provided enough resources to substantially grow the research efforts of KCVI in cardiovascular epidemiology and build bridges to OCTRI and the Department of Biostatistics and Epidemiology, where they will hold joint appointments.

Interested candidates should apply to: Sanjiv Kaul, MD, CEO Knight Cardiovascular Institute, OHSU.
Email: kauls@ohsu.edu



EPIDEMIOLOGIST

The Department of Health Sciences Research at Mayo Clinic in Minnesota is seeking a Chronic Disease Epidemiologist with expertise in neuroscience, aging, biomarker discovery, and clinical translation. The successful candidate will have a Ph.D. in epidemiology and at least ten years post-doctoral experience.

Mayo Clinic is a premier academic medical center with over 3,800 staff physicians and scientists in a unified multi-campus system. This unique environment brings together the best in patient care, groundbreaking research and innovative medical education. Researchers have access to a treasure trove of data sets in Mayo Clinic's robust EMR and the Rochester Epidemiology Project. We offer a highly competitive compensation package with generous start-up funds, sustained intramural support, outstanding laboratory facilities, capital equipment funding, technical and computational resources, and exceptional benefits. The Rochester location combines the comfort of small city living with easy access to additional cultural and entertainment opportunities in nearby Minneapolis/St. Paul. Mayo Clinic has been recognized by *FORTUNE* Magazine as one of the "100 Best Companies to Work For." It is consistently recognized by *U.S. News and World Report* as one of America's "Best Hospitals."

Interested candidates can apply or learn more about this opportunity online at www.mayoclinic.org/scientist-jobs and search 33363BR.

Specific questions should be addressed to:

Rosebud Roberts, M.B., Ch.B.
Chair, Division of Epidemiology, Mayo Clinic
Email: schilbe.jennifer@mayo.edu



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Associate Professor of Epidemiology

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For More Information: Please contact Dr. Hoda Anton-Culver, Chair of the Department of Epidemiology at hantoncu@uci.edu or (949) 824-7401.

To Apply: Please log onto UC Irvine's RECRUIT located at <http://recruit.ap.uci.edu/apply>. See job #JPF02219 under Epidemiology, School of Medicine. Applicants should complete an online application profile and upload the following materials electronically to be considered: Cover letter, Statement of Research and Teaching, Curriculum Vitae, Names of at least three references.

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The University of Arkansas for Medical Sciences (UAMS), Department of Pediatrics (DOP), Section of Birth Defects Research is seeking a mid-to-senior level Scientist at the rank of Professor or Associate Professor to join the Birth Defects Surveillance and Research Center. Suitable candidates should possess a PhD in reproductive or genetic epidemiology, MD with advanced research training, or MD, PhD in relevant fields.

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Applicants must have an MD, PhD, or equivalent degree in epidemiology or closely related field. The successful candidate will have relevant experience in cancer epidemiology research, a track record of scientific leadership and collaboration, peer-reviewed research and grant funding commensurate with rank, a strong publication history, excellent interpersonal skills, and the ability to thrive in a multi-disciplinary environment. CSMC offers attractive employment packages, including salary support, start-up funds and relocation expenses.

Interested candidates should send their curriculum vitae, names and contact information for five references, and a cover letter describing their career goals and research experience to: Dr. Marc Goodman, Director, Cancer Prevention and Control c/o: Academic.Recruiting@cshs.org

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Director of the 'Centre for research in Epidemiology and Population Health' Position in the Paris area (FRANCE)

The Centre for research in Epidemiology and Population Health (*Centre de recherche en Épidémiologie et Santé des Populations, CESP, Villejuif*) invites applications for the position of its Director for the period 2015-2019, renewable. This is a position with tenure, either as Professor at Paris Sud University or Research Director at Inserm, the French National Institute for Health and Medical Research (*Institut national de la santé et de la recherche médicale*).

For more information, see the CESP website, <https://cesp.inserm.fr/fr/>

Questions regarding the position or application process can be addressed to cesp2015@inserm.fr



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To Apply: Send 2 page summary of research career goals and CV to: Patricia D. Franklin MD MBA MPH, Professor and Director Clinical and Outcomes Research, Department of Orthopedics and Physical Rehabilitation, University of Massachusetts Medical School, 55 Lake Ave. North Worcester, MA 01655; (508) 856-5748, patricia.franklin@umassmed.edu



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UNIVERSITY OF MICHIGAN

Department Chair & Professor in Epidemiology

The University of Michigan, School of Public Health invites applications for the position of **Chair and Professor** in the Department of Epidemiology. For over 70 years, the Department of Epidemiology has provided an exciting setting for rigorous interdisciplinary research and graduate education. The Department of Epidemiology has deep strengths that span many disciplines including infectious and chronic diseases, social and environmental determinants of health, genetics, molecular epidemiology, mathematical modeling, methods development, nutrition, and global health. There are currently 40 full-time faculty members and over 200 students (masters and Ph.D. students) in the department. Our tenure-track faculty have 9-month hard money positions and over 50% of our students have tuition scholarships. We seek a Chair who is able to embrace a broad and encompassing vision of epidemiology and who can take advantage of exceptional cross-disciplinary and multi-unit research and education opportunities.

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Applicants should send their curriculum vitae, statement of research accomplishments, teaching portfolio, and administrative experience to: Sharon L.R. Kardia, Ph.D., Senior Associate Dean for Administration, c/o Ms. Linda Feldkamp, University of Michigan, School of Public Health, 1415 Washington Heights, Ann Arbor, MI 48109-2029. Phone: (734) 763-1871; Fax: (734) 764- 8563; Email: lfeld@umich.edu; Website: www.sph.umich.edu/epid. We will begin reviewing candidates on March 15, 2014 and will continue until a suitable candidate is identified. Three letters of reference will ultimately be required.

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The Conference is developed by and for cancer surveillance professionals to learn about the latest trends, acquire new skills, share research findings, improve public health, and support a variety of cancer research endeavors. Our theme is “**Capitalizing on Cancer Surveillance Data for Improved Cancer Control**”.

The 2014 NAACCR Annual Conference, June 21 - 26, 2014, is sure to be a one of a kind event! From June 24 to 28, the International Association of Cancer Registries (IACR)

Ottawa, Ontario, Canada
Westin Hotel



Full information: <http://tinyurl.com/ovyczt9>

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