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Samet Delivers NIH Gordon Lecture On "Big Epidemiology for Big Problems"

Talk Could Have Been Labelled "The Times They Are A-Changin"

Big Epidemiology for Big Problems is the attention-grabbing title used by Jonathan Samet, USC epidemiologist, in delivering the 17th annual Robert Gordon Lecture at NIH. Without being too specific about the definition of big, he described big problems as those with a heavy disease burden, a high percentage of the population exposed, a high relative risk, extensive costs to society, or posing a big future disease risk. On the Big Epidemiology side, Samet included studies with large sample sizes, large amounts of data, a large budget, and/or conducted by a multidisciplinary team.

Main Purpose

Actually, Samet's main purpose in the talk was to provide his perspective on the future directions of epidemiology as the field continues to change in pursuit of its overall goal to understand what drives human health. An alternative title for Samet's talk could have been taken from one of his slides, "The Times They Are A-changin"

Earlier Era

In the earlier era, according to Samet, "…epidemiologists carried out small studies that answered big questions. They found that smoking caused lung cancer and heart disease and that reproductive patterns determined breast cancer risk. One investigator, driven by curiosity, could start and end one study."

The classic example of the successful lone investigator is the story of John Snow and the London cholera outbreak. For other triumphs in epidemiology such as smoking and lung cancer, the number of investigators per study remained relatively small.

A New Era Now

According to Samet, "a new era dawned at the millennium. We entered a time of technology-driven change, large data sets, and genomics. The age of clinical/translation research began." During this period, the growth of multi-authored papers has been significant with increases in papers written by 50, 100, and 200 authors. The most striking increase in recent years has involved the rise in papers authored by more than 500 persons!

Other Trends

Among the other changes noted by Samet are 1) the growth of health systems based research and electronic medical records, 2) the use of systems approaches to tackle problems, 3) increased data sharing and access, 4) a view of research as a public good with its associated demand for greater accountability, 5) the emergence of new disciplines like bioinformatics, and 6) an increase in the creation of networks and networking to address problems.

Samet called these changes a paradigm shift and illustrated each from his own career. For example, he admitted he was not keen on data sharing when at the outset of his career after working hard for ten years to collect data for his first study. However, he stated he has changed his mind on this issue and now supports data sharing.

Model of a Public Health Problem

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Also, Samet described the use of a model depicting the stages from experimentation to disease to assess the impact of menthol cigarettes on public health. The model, recently described in the NEJM was helpful in pointing out the actual places in the pathway where epidemiology could be useful, while at the same time illustrating that epidemiology was not by itself the whole answer to solving this public health problem.

Impact on Epi Careers

According to Samet, these paradigm changes have implications for the careers and training of epidemiologists. Right now, he said, "…we are training epidemiologists the way we used to," and he believes that the time has come to rethink this training. Is it necessary for students to carry out their own cohort study or is best for them to learn to download data to be used as part of a larger undertaking? How can young scientists become independent scientists in this environment? Should they become team members or team leaders? And how do scientists gain credit for their contributions?

Samet noted that this latter point is becoming more of an issue in academia where promotion letters highlighting team contributions are being read by bench scientists on promotion committees who do not share the same appreciation for "team science". Such science has not yet drilled down very deep into the way many scientists think, according to Samet.

Optimism

Samet was careful in his talk to make sure that listeners did not interpret his stance on epidemiology to be a pessimistic one. He said he is optimistic about epidemiology and would not want any young persons to change their mind about such a career path based on his assessments. He brought up a favorite quote from former Governor Richard Lamm of Colorado to buttress his point. He stated in 1986 that "the major factors that brought health to mankind were epidemiology, sanitation, vaccination, refrigeration, and screen windows."

Samet closed his talk by noting further that epidemiology's appeal is its potential to save lives, not one at a time, but millions at a time. To view a videocast of Samet's Gordon Lecture, visit http://videocast.nih.gov/pastevents.asp?c=0&s=21

Join the discussion online at Talking Epidemiology (www.epimonitor.net) about the implications and impact of these changes on the careers of epidemiologists in academia and in other sectors.