Initiatives to Train the Public Health Workforce
Toby Citrin, J.D.

DR. McGRATH: I would like to introduce Toby Citrin, the next speaker, who is with the Center for Public Health and Community Genomics in Michigan. Thank you for coming.

MR. CITRIN: Thank you. Good morning. I would like to comment very briefly on the significance of using the paradigm of genomics in the public health setting, talk a little about the extent of current and anticipated demand for knowledge in genomics, both as seen from the perspective of the schools and from the perspective of public health practice, to identify some of the barriers that stand in the way, as well as identifying some of the facilitators that are moving the field forward, and then to summarize some of the progress that has been made since your last roundtable, and end with some recommendations.

Your earlier resolution in 2004 makes a point of the distinction between genetics and genomics. This is a very important distinction for public health. The CDC's website of its National Office of Public Health Genomics also defines genomics in a very useful way.

For public health, it is extremely important to be using the genomics paradigm because it fits in quite well with the ecological model of causation of health and disease, which has increasingly been utilized both in the teaching of public health and the practice of public health. Both of the landmark reports on public health by the Institute of Medicine in 2003 make strong recommendations to utilize this ecological model, multiple factors working from the inside out, from the outside in, over the lifetime, and it is very easy to incorporate the genomics framework within the ecological model.

Consistent with that, we are seeing movement both in teaching and in practice from viewing genetics as a separate, almost autonomous field of study and practice into genomics as being worthy of incorporating in all of the fields of public health, both as taught and as practiced.

But let's look at the reality of what is being asked for today both in practice and in academe. When you look at practice, the extent to which genetics or genomics are playing roles in the practice of public health is still quite small. We have traditional newborn screening programs and the expansion of genetic testing within those programs. We have the early evidence of almost experimental utilization of family health history in prevention programs for chronic disease, adding these histories as additional risk factors that are useful in developing prevention programs for chronic disease.

Then we have early signs of the acceptance by some health departments of a role in health education to try to get the public to understand what we mean by genomics and how it relates to their health.

Looking into the future of course, we see an ever growing need for knowledge of genomics in public health practice. A number of commentators speak of the revolution that will take place not just in medicine but in public health which will individualize public health. It almost sounds like an oxymoron. But the increasing knowledge of relative risk on an individual basis is inevitably going to shift the way that public health designs and implements programs.

What will bring us to that point is the process of translation of research into methods and interventions that are seen as useful in improving population health. Dr. Khoury has been the lead author of a very important article that appeared just a month ago in which he expounds on a

four-step process which brings us from gene discovery to health application, from the applications to evidence-based guidelines, from guidelines to practice, and from practice to health impact. It is a paradigm that does not simply apply to clinically provided genetic services. It applies equally to public health interventions.

We are now moving to the academic side. In 2003, in the report on the teaching of public health called "Who Will Keep the Public Healthy?" that had just come out prior to your last roundtable, genomics was identified as one of eight content areas that needed to be taught to everyone going through a school of public health in addition to or as incorporated in the five traditional areas that are the basis for public health education.

So we are seeing evidence that departments of epidemiology have a number of courses in genetic epidemiology. Departments of biostatistics are teaching statistical genetics. Increasing teaching in genetics and its interrelationship to environmental harms and hazards are seen in the teaching of environmental health. Less evident but extremely important is the advent of incorporating genomics in the teaching of public health policy and the teaching of the ethical, legal, and social implications of genomics within departments of health management and policy.

Finally, some of the good news is the significant increase that has been occurring in the incorporation of genomics in the teaching of health behavior and health education. Not so much the influence of genes on behavior but rather the implications of genomics for the way human beings behave in healthier or less healthy manners.

So let's move to the barriers and the facilitators. When one looks at academe, we have the common resistance to any significant changes in curriculum. It has been a constant through a number of the presentations this morning. Insufficient time that people feel already to convey the information that is seen as necessary for public health professionals, and the sense that we are adding yet another overlay on what is already not taught deeply enough.

Certainly, a lack of expertise in most of the faculty to incorporate genomics in their teaching, and to a continuing extent, hopefully lessening over time, non-recognition of the significance of genomics in public health.

[There are] still vestiges of antagonism to the teaching of genomics by those who feel that there is some sort of zero sum gain going on here and the more one talks about genomics and its causation or participation in disease and in health disparities, the less attention one will pay to social and environmental factors.

If you want a good piece of evidence on this antagonism, just take a look at the article that is in your packets by Claudia Chaufan relating, in that case, to the proposed Large Population Study. But one can read in that article this same notion of the less-than-worthwhileness of spending that much time on genomics when we are trying to address serious issues of health disparities.

Let's move to the practice of public health. Same barriers and resistance to change, and more so in the public health setting these days because of ever-tightening budgets, new requirements with respect to preparedness for bioterrorism and communicable diseases.

A good example of how serious this particular barrier is was the talk given by the outgoing president of the American Public Health Association, Deborah Klein Walker, at the annual meeting of APHA earlier this month, in which she really said that one cannot expect public health departments to take on the new fields of informatics, of genomics, new approaches to disabilities,

when public health departments are being starved of resources just to do the most fundamental core functions for which they were formed.

We have continuing evidence of a rather narrow focus on genetics in most health departments, happily not all, where genetics is seen a subset of maternal and child health in the organizational structure of health departments. And, the lack of tools, the lack of evidence-based, off-the-shelf tools coming from genetics research that are seen as useful to public health professionals in addressing major health issues of populations.

Turning to the brighter side, what are the facilitators. Certainly chief among them is the National Office of Public Health Genomics at CDC, which has been the primary place where a continuing array of information of significance to public health and public health practice occurs in workshops and various trainings that emerge from that office. Among its strategies have been the funding of two centers for genomics and public health, one at University of Washington, one that I direct at our university, Michigan, both of which are committed to expanding the knowledge, training, and utilization of genetic tools and information by public health practice.

CDC has also been funding four states -- Michigan, Minnesota, Oregon, and Utah -- to develop comprehensive genetics and genomic programs in order to establish models of how genetics needs to be dealt with comprehensively in a state-level public health department.

A very bright light in the future, just two or three weeks old, the official formation of what is called the Genomics Forum at the American Public Health Association, a group of over 200 people now who are identifying themselves as public health professionals, community people, and academics who are very interested in working together in order to further genomics in the public health framework addressing the goals of public health.

Other facilitators and potential facilitators are the efforts underway to standardize competencies in public health teaching and practice. Several years ago, the CDC launched and funded an effort which ended up with a set of genomic competencies for the public health work force. The website is in your materials.

The Education Committee of the Association of Schools of Public Health has developed a set of competencies for the master's of public health degree. No sanctions or requirements here, but simply advisory to the schools.

Unfortunately, in the enumeration of cross-cutting competencies in this Association of Schools of Public Health effort, the caption is "Public Health Biology" and not genomics. Within public health biology, one of 10 competencies is the competency to explain how genetics and genomics affect disease processes in public health policy and practice. But at least there is a formal adoption by a group representing the schools of the need for genomics education in the schools.

Also of potential significance, and there is controversy on just how significant, but there is a launch coming in August of 2008 of a new examination for a certificate in public health which would apply to people who already have a master's degree but want to have a form of credentialing that is based on a standardized set of competencies in public health.

The examination will incorporate the competencies for the MPH degree that has come out of the Association of Schools of Public Health, and therefore there will be a genomic component of that certification.

Looking at the number of courses and centers and programs on genomics and genetics in the schools of public health in comparison to your last roundtable, we had a couple of graduate students do a Web search in anticipation of this roundtable, as they did last time.

In 2004, or your meeting in 2003 leading to the 2004 resolution, there were 10 schools of public health that had any kind of genetics programs. Most of them were in the research area. There were only 12 schools of public health that had courses that were identifiably genetics in their topic. Of these, a very small minority of schools had courses in the ethical, legal, and social implications area.

Significant progress since then. All but six of 38 schools of public health that were subject to this Web search have now genetics courses identified as such. Ten have centers focusing on genetics, and seven have actual curriculum tracks that highlight genetics. Our students counted a total of 193 courses identified as genetics or genomics courses in the schools of public health.

A small portion of those, 21, are in the areas of health management, law, ethics, and policy, the bulk of them continuing to be in the departments of epidemiology, biostatistics and, to a growing extent, as I mentioned, health behavior and health education.

Looking at the training of the current work force as distinguished from the future work force, there are hundreds of sources of training materials on genetics and genomics that are available online. To my knowledge, there has not been a comprehensive collation and compilation of these courses. There are several hundred. There are several places where one can go to see an array of these. One of them is the CDC website.

There is an effort underway by two people at the Genetic Alliance, with which our center is about to connect, in order to list and codify the online trainings and provide some sense of level of competency that they address. The Network of Public Health Training Centers has developed a searchable website identifying four courses given by public health training centers that are identified as genomics courses.

Still very little progress in teaching or practice in diversifying the public health work force that incorporates genetics in practice. It is certainly an issue that runs entirely through this field. When one looks in at schools of public health, and it is certainly true of our school, the growing diversity of the student population in schools of public health is not represented in courses or programs in public health.

We have between a quarter and a third of our students who are from underrepresented minorities. In the course I teach, for instance, which is a required course and an elective, out of 29 students I have only one student of color in the entire class. That is very typical and rather sad.

It is quite clear that if public health genomics is going to achieve its potential it is going to have to be more representative of the population that public health sees as most essential to reach with public health interventions.

Finally, recommendations. In addition to trying to find a way out of this problem of achieving diversity, the schools and the health departments need to implement the recommendations on genomics that are in both of the Institute of Medicine reports.

We need to develop a way to gather systematically the data on the extent to which genomics are included in the teaching of public health, not just labeled as such in course titles but incorporated in a whole variety of public health courses.

We need to achieve a sharing of models of genomic teaching as a way to address the lack of competency in many faculty members to develop their own total courses or to develop their own case studies to incorporate in courses that ought to have a genetic component.

Consideration needs to be given to having genomics identified clearly as a standard for accreditation of schools of public health by the Committee on Education in Public Health, which is the accrediting body.

Public health education not only needs to increase the focus on genetics but also on the ethical, legal, and social implications of genetics. Some of us would like to see the fiscal ability of CDC to broaden the network of genomics in public health centers to a more regional basis in order to serve the needs and the potential of health departments throughout the country.

Thank you.

[Applause.]

DR. McGRATH: Thank you very much. That was a great overview of the public health efforts.

With apologies to everyone, we are going to hold questions again so we can get to the last speakers. I promise we are going to save more than a half hour for general discussions. I apologize for limiting them right now. We are running a little bit late.