CONSUMER-INITIATED USE OF GENOMIC SERVICES

Session Overview and Purpose

Sylvia Au, M.S., CGC

MS. AU: Thank you, Steve. You know how important direct-to-consumer is when our esteemed colleague Jim Evans is quoted in a magazine on direct-to-consumer genetic testing. He is quoted in an article titled "Tempted by At-Home Gene Tests." He says, "Without guidance testing results are, arguably, worthless," which is a typical Jim statement, for those of you who know Jim.

[Laughter.]

MS. AU: The purpose of this session is to provide an update on government and private sector activities related to direct-to-consumer genomic services since the session on personal genome services that we had in July 2008. After the speakers, we are going to be looking at some short-term action steps that the Committee might like to consider to help address some of the issues around direct-to-consumer genomic testing.

Our first speaker is familiar to all of us. it is Greg Feero. He comes to us from the NIH National Human Genome Research Institute, and he is the chief of the

Genomic Healthcare Branch.

Outcomes of an NIH-CDC Workshop on Personal Genomics (December 2008)

William (Greg) Feero, M.D., Ph.D.

[PowerPoint presentation.]

DR. FEERO: Good afternoon. Thank you for having me before you. I'm actually a substitute for Muin Khoury, who could not be here today to present this. I think that most would agree that probably this meeting that I am about to report on was largely his brainchild.

I am going to talk to you briefly about a meeting that was held on December 17th and 18th at the NIH, sponsored in part by the CDC as well, to look at the scientific foundation for the most recent wave of direct-to-consumer testing vis-a-vis the genome scan type of technologies.

To give you a little bit of context for the meeting, personal genome-wide scans have become quite inexpensive. The cost is going down, it seems, on a quarterly basis. They are directly available to the public.

The research discoveries that are coming from

genome-wide association studies that relate to the genetics of common complex disorders are very rapidly being moved from the research setting directly to a place where they can be marketed to the public and also to healthcare professionals. Sometimes this isn't even within days of publication, it is the same day of publication, as was the case for some recent prostate cancer discoveries.

Obviously, there is vigorous debate about how and when to translate these types of research discoveries from genome-wide association studies to healthcare applications to make them available to the public. This Committee has talked about many of these issues in great detail over time.

The particular meeting that occurred on December the 17th and 18th really focused largely on the issues of clinical validity, clinical utility, and education, I would say. Some of the other issues, although recognized as being very important, were not really a central focus of the meeting.

I think for everyone that was present at the meeting the goal was to take the complex scans, who are in this far realm of potentially dubious use in clinical care

and for healthcare purposes, and really migrate them back, through developing an evidence base, to a position here on this scale where they actually become a part of preventive services.

As I mentioned, the meeting was sponsored by the NIH and the CDC. A really major co-sponsor was the National Cancer Institute. The National Heart, Lung, and Blood Institute also participated, as well as the NHGRI.

The meeting itself was a two-day event. There were approximately 100 attendees. It was a jam-packed agenda. There were 40 speakers and panelists. I'm afraid some of the speakers were quite frustrated because they were given a very short time period to get very complicated stuff across, but there was ample time, I think, for discussion in many of the sections. That was part of the reason the speakers had such a short time to actually speak.

Diverse perspectives were presented, including government, academic, and industry perspectives. There was a blend of both didactic presentations and mediated discussion panels on the topics at hand.

It was broken down into several sessions. I will

just go quickly over those and the people that chaired them. The first was getting people on a level playing field with regard to the basics of genetic and genomic profiles and risk assessment in personalized health. That session was mediated by Greg Downing.

The next really dealt with the scientific foundation for which the variants could be included in genome profiles and essentially dealt largely with the issues surrounding clinical validity of the markers.

I think most people at this meeting felt that, at least for the major purveyors of the genome-wide scans, the analytic validity was not so much in question for the markers. The clinical validity is really where the discussion started.

Then there was a large discussion about how you go about establishing the clinical validity and utility of genome profiles.

The following day there was further discussion around case studies for clinical validity and utility, a discussion of models that could be used that go beyond the randomized control trial to demonstrate clinical utility, and then, finally, a discussion of next steps.

The most immediate next step from the meeting was the development of a manuscript based on the content of the meeting. That is currently in preparation. I believe it is slated already for one of the major genetics journals. I thought I would go briefly over the five main points that came out of the meeting.

The first, and you will hear more about this this afternoon from Amy Miller from the PMC, is that there was a general consensus -- and there was already movement in this direction prior to the meeting -- that the industry itself that is offering these types of tests should work to develop industry-wide scientific standards for personal genomics. That really has to occur in partnership with other groups besides industry because a lot of the information that the industry relies on to make their risk assessments is generated from studies that are well beyond their means to conduct on their own.

The next is to develop and implement a multidisciplinary research agenda. It was recognized at the meeting that no one organization or one bin of science would be sufficient to move the ball forward in terms of understanding the utility of genome-wide profiles. Novel

public-private partnerships would have to be developed that encompass folks from multiple disciplines and perspectives to move this forward. To some extent, the GaapNet proposal brought forth by Muin Khoury as a potential architecture for public-private partnerships, was also discussed.

Another is, enhance credible knowledge synthesis and dissemination of information to providers and consumers. This is really to reinforce a lot of the work that AHRQ, EGAPP, and others have been trying to do. It was discussed extensively that providers, policymakers, the public, and public health officials all need unbiased sources of information that are truly accessible for this type of testing. That accessibility means not only from a literacy standpoint but also accessible from a cost standpoint.

There was also a feeling that not only do you need to have the information but that there needs to be somebody that is familiar with the ins and the outs of this type of testing that could actually make recommendations based on the information. That would take the public and the providers out of having to be the absolute experts on the information and allow them to be at the 10,000-foot

level when trying to make an assessment with regard to the utility of this type of testing.

Finally, there was a substantial discussion about the definition of clinical utility and what all that means. I think there is a growing understanding that these tests may have value beyond the immediate clinical setting but extends into the individual's own perceptions and behaviors that isn't directly clinical. There was a feeling that this is almost certainly true but right now there aren't very good objective measures that can be used to determine the absolute value of this personal utility. Therefore, it is very hard to study and make recommendations about its magnitude of value in healthcare systems or society in general.

I would like to conclude just by saying that the slides from the meeting are all available. In your handout you should have this slide showing the .gov website. I think you will find a wealth of information there. It really was quite a rich conference.

I would be happy to take questions, if that is permitted. I will try to answer them. Since I'm not Muin, it may not be possible.

Question-and-Answer Session

DR. EVANS: Greg, would you go into this a little more? I'm frustrated by this notion of personal utility.

My analogy with that is that many people in the U.S. would claim that their horoscope has personal utility. The problem with that concept of personal utility is that by its very nature it is a way to get around objective standards. While people may find horoscopes personally useful for a variety of reasons, I don't think in the absence of objective data it holds any water. I hate to see the discussion about personal genomics derailed and diverted by what I think is an intentionally obscured notion.

DR. FEERO: Obviously, I can't fully address your question. I would state that there are competent folks out there even in the academic realm that make arguments that if in fact even slightly erroneous information results in an individual improving behavior and improving outlook on their health that that is of intrinsic value. I think that is an interesting and potentially perilous argument. I think the idea that you need to come up with some metrics to measure this will clean things out in the wash, if you

will.

MS. AU: I think Marc is next.

DR. WILLIAMS: I'm a little bit concerned about the other end of the spectrum, which was the idea that the analytic validity is assured. This may represent ignorance of the actual testing on my part, but the information that was in our packet from PMC regarding the accuracy of the tests was saying that they are delivering the tests at a 99.9 percent accuracy. On the surface that seems good, but if you are doing a one million SNP, that is a thousand wrong calls.

Some of these relate to where you are aggregating 50 or 100 SNPs, and you could argue that maybe the incremental harm there is less, but some of the things that are incorporated into these relate to specific mutations in genes like BRCA and CF. If you make a wrong call there, then I think there is a very different impact. I'm a little bit concerned that we may just say these things are valid and we don't need to worry about them.

DR. FEERO: I think that the meeting attendees would agree with you, but the focus of the meeting was really on the clinical validity issue because it looms in

most folks' minds right at the moment, with these types of multiple-gene scans, higher on the profile of potential problems.

I don't know if there were other attendees at the meeting who are on the Committee. Feel free to also comment on that.

DR. FERREIRA-GONZALEZ: I understand what you are trying to say with the major need to look at the clinical validity of this, but we cannot forget the analytical validity. We have here the potential to maybe start developing the clinical validity, but we cannot disregard the analytical validity.

DR. FEERO: Correct. The point, though, is that let's say 99.9 percent of the time you are giving the correct genotype but only 15 percent of the time is that genotype actually reflective of actual risk. The major problem doesn't lie in the analytic validity, it lies in the clinical validity. That was the major focus for the scientific discussion at this particular meeting. It wasn't the nuts and bolts of the CHPs.

MS. AU: We will take Kevin and then we will move on. There will be time for other questions after everyone

has spoken.

DR. FITZGERALD: I wanted to just get a better sense of the personal utility. I understand, Greg, this wasn't your idea or anything like that, but you were there.

My concern is, as we look ahead and we are trying to figure out exactly how to take this landscape of personalized medicine and understand it in realistic even economic ways, it may be true that with the technologies and techniques we have now, there are certain people that could make Jim look like this if he so desires.

[Laughter.]

DR. FITZGERALD: I want to know, is that going to be considered health? This is the issue. If we are going to get personal utility merging with clinical utility in any way, we are really going to be taking that landscape and making it extremely amorphous.

DR. FEERO: Obviously, that is a boundary issue that I think goes well beyond personal genome-wide scans. That is across the playing field of preconception counseling. Where are the boundaries.

MS. AU: I think Paul wants to speak.

DR. BILLINGS: While I may have a lot of ideas

about the issue of personal utility, I will point out to this Committee that this is not an issue that is new to genetics. For instance, there was a long argument in genetics around the notion that any test that didn't have a specific treatment was not worth providing because there was no action to be taken upon it.

The determination of what that action was, was generally made by the provider, while patients, for instance, might have chosen to change their will as a personal response to the information that might have been contained in the genetic test.

DR. FEERO: I think that was articulated very well at the meeting with the Reveal Study with Alzheimer's.

DR. BILLINGS: Exactly. What I would just point out is that personal utility is an evolving concept. While I can understand some of our friends' objections to some of it, I don't think it is to be trashed altogether.

MS. AU: Thank you, Greg. Cathy reminded me that at the end, after all the speakers finish speaking, we will have them come back to the front and answer questions.

Our next speaker is on the telephone, actually. Christy White is the founder and principal of Cogent

Research. They have a longitudinal study of American awareness, acceptance, and preferences for genomic-based benefits, products, and solutions. She is going to be presenting on some of their work today.

Your slides are up, Christy.

Genomic Attitudes and Trends

Christy White

[PowerPoint presentation.]

MS. WHITE: Thank you. I will just briefly talk a little bit about the study.

As was mentioned, it is a longitudinal study. In this report we will be reporting on three years' worth of data. The goal of the study, on the Objectives slide, slide no. 3, is really for us to have this comprehensive, actionable assessment of where Americans' attitudes are and to monitor those over time.

Our goals are to look at awareness, attitudes, and preferences for using genetic information and to really understand what their views are. Are they similar or divergent. What are their views in general as it relates to both nutrigenomics and pharmacogenomics, or personalized medicine. We also look at that through a variety of

different types of consumer models.

The objectives that we cover are on slide no. 4. There is a lot of data in this study. I have about 10 minutes and I'm going to focus on some of the critical issues specifically as they relate to DTC testing, but I have a couple of overview slides as well. There is a lot more in the research. If there are specific questions that the Committee has or there are things they would like to know, I would be more than happy to share specific pieces of this data with you. This just helps you understand more holistically what we cover.

The survey itself is about 120 questions. It takes about 15 minutes for consumers to do. We cover a lot of awareness, interest, and usage areas. Are they aware of the role of genes, are they aware of genomics in particular, are they interested in that. What specific health benefits are they looking for. We do actually delve into the whole issue that was being talked about earlier in terms of are they only interested if there is a specific benefit or treatment on the back end. Also, what have they actually done surrounding genetic testing.

We also look at perceptions and barriers. What

do they think is good about genomics. What are they concerned about. We have a lot of information on discrimination. I know we have covered that in previous meetings. That continues to be an issue for consumers.

One of the things I won't cover today but can just tell you is there is very low awareness of GINA and no change, really, in consumer confidence that their information will not be used in a discriminatory fashion. I have that data and can share it with the Committee very easily if you are interested.

Then we get into more of the stuff we do on the for-profit side around what do consumers want, who will they share with the information with, how do you best communicate with them. Then, as I mentioned, we do look at some policy-related information.

The methodology of this study is on slide no. 5. This is a representative sampling of the U.S. population. It is a Web-based survey and has been throughout its history. We are very careful in setting up quotas based upon U.S. census data to make sure that we get the right representation of age, income, ethnicity, region, and gender. We look at those numbers very carefully on the

back end as well and, if necessary, do any weighting, which is usually minimal, to ensure that we can project this to the U.S. population.

We talked to a total of a thousand consumers. The sampling error for looking at this data is about plus or minus three. As I mentioned, we will be comparing this and looking at trending data to other years. We are looking at a sampling error of plus or minus four.

Slide no. 7. One of the first things we do in the survey is look at overall awareness. As you can see, awareness has basically been hovering around 75 percent. Although we did see a statistically significant lift, it really isn't much in terms of total numbers. We started out with about 75 percent of the U.S. population saying they were aware of using genetic information to understand and optimize health. We don't actually ask them if they have heard of genomics, but we explain it to them in basic terms. You can see that that number at this point is at about 79 percent, which is a slight lift over what we have seen in previous years.

So they have heard of this general idea. We wanted to delve more deeply this year into direct-to-

consumer testing and the availability of Web-based tests. In fact, we had talked with a couple of people at HHS. Scott Boyle and Greg Downing had given me some feedback on these questions when we were developing them.

They read a brief description of what we meant by personalized genetic profiles, which I will read to you. Over the past year or so, a number of Web-based companies have started to offer personalized genetic profiles directly to individuals. These profiles are based on a DNA sample collected using an in-home kit and provide you with information about your risk for approximately 30 diseases, such as arthritis, diabetes, and various cancers. Have you seen or heard anything about these personal genome services?

As you can see, about 12 percent of the population we surveyed said that they had in fact heard of some of these, which, frankly, was a bit higher than I had expected but still is only about one in 10.

We followed that up with a question asking what exactly do you think it means when these companies say they provide information about your risk. This was actually a

multiple-response question because, as you know, it is not always the same. Interestingly, consumers chose pretty much only one response.

There is a lot of confusion. As you can see, there is very little agreement on exactly what it is that they would be getting for their money if they did choose to have such a test. About a third said that it would identify the chance of getting a specific disease, so that it would in fact give them some kind of a figure, like a 67 percent chance.

The next-greatest proportion said that it would tell them if they were at greater risk but it really wouldn't give any information about to what extent or exactly what the level of risk was.

Around one in five thought that it would just say that their genes look similar to those associated with the disease but not whether they had any increased risk level.

Only about 7 percent said it would determine whether they definitely will or will not get a specific disease. So only a few consumers are saying that it really cannot tell with any definitive answer whether they will get a disease or not.

Four percent said it would tell only if they already had a specific disease. Interestingly, only 8 percent weren't willing to wage a guess here in terms of what they thought it meant.

I think the key here is that consumers are willing to make an assessment of what they think they are getting, and what they think they are getting is really very variable.

On slide no. 9 we look at how interested people are. We know that about one in 10 are aware specifically of DTC, but just in general we wanted to know how interested they were. You can see, again, it hovers around 50 percent. We haven't really seen much of a change over the past few years. Just about one in two consumers are saying that they are interested in using their genetic information for the purpose of understanding and optimizing their health.

We do see that there are specific subsets of the population that are disproportionately interested, and those are those with household incomes over $100,000 and those whose health profile has them on three or more prescriptions.

On slide no. 10 we look at what they actually want from these tests. Are they looking to just test for an individual condition or issue or do they want to know everything, all issues at once. You can see that there is a huge preference for that. Consumers are three times more likely to say that they want to test once and they want to get as much information as possible about what their genetic profile says about their health status.

One of the other interesting pieces of information on this slide is the fact that you really only have about 20 percent of the population, and now 13 percent of the population, saying that they would never have a genetic test, they are not open to having a genetic test.

On slide no. 11, we actually asked consumers about very specific diseases and said what diseases would you be most interested in knowing about. I think one of the interesting things here is that when you roll up all the information and you look across all of the answers that Americans provide, actually 91 percent of them would want to test for at least one condition. So that 13 percent that said they would never have a test is probably really more like 9 percent. That is not too far off, but you do

get a little bit more interest when consumers start to think about the specific things that they might be able to test for. So, large numbers of Americans are very interested and can think of something that they would want to test for.

You can see some of the things that they are most interested in. Cancer definitely shows up in the top 10 quite a bit. Also Alzheimer's, and of course heart disease, not surprisingly, is right up there at the top.

On slide no. 12, one of the things that we noticed in this research this year is that consumers are feeling empowered. Across a lot of the questions that we asked we saw a lot more willingness to act on their own and not necessarily share the information with their doctor unless there was a problem, which we will talk about in a minute.

We have a question where we ask people would they actually involve their doctor in the decision of whether to have a test or not. We have seen a drop in that number. What we also see on this slide here is there is an additional drop in the number that are saying that they would share the information or they would want the results

of that information to be shared with their doctor.

I think that obviously has a lot of implications, if you think about the fact that consumers are very interested in these tests. They can think of areas they would like to have the test. They don't necessarily what the information means when they get it, and only one in two are saying that they would involve their doctor in the discussion of that information. This increased empowerment on the part of consumers is something that I think is really important for the Committee to keep in mind.

Slide no. 13. If they were to get the results and it were to indicate that they were at risk of a disease, now there is a slightly different story that emerges. You do see that the majority of people are saying yes, I would go and bring this information to my doctor or I would talk to my doctor about it.

We also wanted to look at some other actions. You can see about half are saying that they would want to see their physician more often to have some type of screening done. A little bit less than half are willing to make some lifestyle changes, either diet or exercise. I think that feeds into what we do know is an increasing

belief on the part of Americans that diet and exercise are factors that can heavily influence their health status.

Only a third said that they would tell their family. We do know that consumers are very worried about the emotional burden of having a test and they are not willing, as you can see, to share that burden with their families.

One in four are saying they would take prescription medication on a preventive basis. Thirteen percent are saying they would consider preventive surgery. Only about 4 percent say that they would not do anything as a result of that information.

Those are some of the highlights that I thought would be of most interest to the Committee. As I discussed, there is a lot of data and information in the study. I would be happy to talk with any of you individually or to provide information to the group as a whole if there is any other additional information that you think would be beneficial.

Question-and-Answer Session

MS. AU: Any comments or questions for Christy right now? Dr. Dale.

DR. DALE: I have first a comment and then a question. It looks to me like this panel you showed us about the difference in sharing information between '06 and '08 shows a general trend downward. I don't share it with anybody. I interpret that as distrust.

The other comment that I would like you to respond to is, did you ask if people would want their samples saved for future discoveries or in some way get at the concept of a bank or storage?

MS. WHITE: We do actually cover that information in the study. I would have to look it up to be sure, and I know we are going to get back to questions later on so I will make sure I have that data. It was my understanding that that has also declined. Very few people want the information to be saved, but I will get those actual numbers for the later discussion.

DR. DALE: I'm thinking about saving the DNA.

MS. WHITE: Yes, absolutely. That question is covered.

MS. AU: I think we will move on, in the interest of time. Our next speaker is Larry Thompson. He is going to be telling us about the NIH Website for Consumer-Level

Information about Direct-to-Consumer Genomic Services. Larry comes to us from the National Human Genome Research Institute, and he is the chief of the Communications and Public Liaison Branch.

NIH Website for Consumer-Level Information About DTC Genomic Services

Larry Thompson

MR. THOMPSON: Which may make you wonder, why is a communications guy up here talking about this? That is probably mostly because I have to do with websites.

Let me talk to you about three parts of this and give you a little bit of history of why NIH is moving towards trying to create a resource. We just did our own consumer research study as preparation for this so we wouldn't just completely make this up. Then let me tell you a little bit about what it is that we are thinking.

Of course, you all know that these direct-to-consumer tests started about two years ago. Out of that came some concerns by NIH leadership because they are outside of the medical model. These are complicated tests. The answers are not always particularly clear as to what they mean.

They were being marketed as entertainment or the new pet rock or something. People were worried that this would become viewed as genetic snake oil by the public so that when this stuff really did work people would be skeptical about it.

Plus, we were hearing things like from one writer who has a book coming out. He was tested. One company told him that his heart disease risk was low, another said it was medium, another said it was high. That gives you a sense of how reliable this is.

We also learned of a physician in Philadelphia who was told his risk was really low, don't worry about a thing, but he of course had already had a major heart attack before the test was done. So the anecdotes were not reassuring and raised a lot of serious questions.

Dr. Zerhouni, back when he was the director of the institutes of NIH still, charged a bunch of IC directors with coming up with some plan to communicate to the public very authoritative stuff so that they would have a place where they could go when they wanted to understand that.

A trans-NIH committee was created. Dr.

Guttmacher, who was the deputy director at NHGRI at the time and is now the acting director, and John Burklow, who is the associate director for NIH, were the co-chairs. Alan Stepped down when he took over as acting director at Genome, and I replaced him.

We started moving very quickly to start making a bunch of sites and do things. We also started looking around in the world out there. It looked like we were creating much of the same information that was already out there, and so we began to wonder what we were doing. We ran out of momentum and started to slow down.

Then our friends at the Cancer Institute offered to actually do some market research for us. I'm a former journalist. We just go out and tell stories and make stuff up. Instead we thought we would actually do something different and get some information first, and so we decided to go ahead with this study, which was done last fall.

The report was just presented to the trans-NIH committee last week, so this is very good timing. I can tell you a little bit about what we found. It sounds very much consistent with what we just heard from Cogent, which is always encouraging, because ours was done as focus

groups.

Let me tell you about the research and how that is affecting us. We did 10 focus groups in Chicago, New York, and Washington. Eighty-four consumers participated. We also did in-depth interviews with nine physicians who were in primary care practice.

On the consumer side, demographically we had 61 percent women, 39 percent men. Not surprising, since women tend to focus on health more than guys. Seventy-seven percent were white, 18 percent were African American or black, 5 percent were other. Only 13 percent were ethnically Hispanic. I think we have to keep this in mind because of how this skews the population.

Also, this was a very educated group, which in some ways also skews it. All of them had high school diplomas. Many of them had been to college and a substantial number had college degrees. Half had children, so they were worried about inheritance if there were diseases running in the family.

We tried to stratify the consumers into three different groups: people who were not thinking about genetic testing at all, people who were thinking about

doing it, and then people who did it. The last group we called doers, the ones who had actually had a genetic test.

We asked the recruiters to specifically go try to find people who had had direct-to-consumer tests like 23andMe or Navigenics, and they couldn't find any. Now, this is just a sample, and it is a very small sample, so it is not too surprising that we couldn't get any in who had done it. But they looked for them specifically, and that really made us all wonder. I don't know what to make of it. Again, it is a very small sample, but it was very interesting.

Let me tell you about the results from the consumers and then we will go to the doctors. Again, these are not quantitative. These are focus groups. We are trying to get impressions about what is going on.

Most consumers, at least in the focus groups, were broadly aware of genetic testing. That is probably why they agreed to be in them. They knew very little about the details of them, and when they were pressed for details they got stuff wrong all over the place. There really is not very deep knowledge among the public.

Many did not want to know their risk of getting

certain diseases if there was no treatment or cure. If they couldn't do anything about it medically, they didn't really care. Some said they did want to know, especially if they had a family history of a disease running in the family. They wanted to know if they were at risk themselves.

Most consumers were still very concerned about privacy and confidentiality. I'm not surprised to hear from Cogent that most people don't know about GINA. There is certainly a lot of work to be done about that. The consumers were particularly concerned about insurance companies and employers.

Most thought that a trained health professional should be involved in interpreting the test. They recognized that their own ability was not so good to really understand this stuff.

All the doers who had taken a genetic test had done so specifically because of a family history. They wanted to know what their risk was. Again, that is not too surprising.

In general, the consumers wanted us, the government, to provide lots of reliable, unbiased

information. That is actually good news for the effort that we are looking at.

The results from the physician interviews were pretty interesting, not particularly surprising. Just to give you a little context on the practice setting for the docs, six were in small private practice, two in large private practice, one in a hospital practice, but they skewed older. I was a little disappointed at that when I saw their results. Two had practiced one to 10 years, two had practiced 11 to 20 years, and five had practiced 21 or more years. Genetics has changed a whole lot in that period of time and they didn't have a lot of that in medical school.

It is consistent with NHGRI's fundamental concern. When all this information starts pouring into the medical system that physicians are going to be deluged with it, we are worried about whether they will know what to do with it, frankly.

Again, these were interviews. The findings were that genetic testing really doesn't come up much in their practice. It just doesn't come up.

Few have had patients ask for help interpreting a

genetic testing, including the DTCs. They are just not seeing it in their practice. The doctors really felt that patients don't understand probability and really had no idea how to interpret the results of a genetic test.

The doctors also felt that patient information about genetic testing that we might be providing needs to be really practical and not technical at all. I guess I'm going to have to drop that wonderful graphic I made about how many angstroms there are in a single turn of DNA. We'll just forget that.

[Laughter.]

MR. THOMPSON: Many of the doctors said that they did not know enough about the kinds of genetic tests that were out there. They didn't have classes in medical school on it and, really, they wanted us, the government, to provide a list of approved tests. Of course, NIH is probably not likely to do that.

It certainly raises the question of vetting and endorsement issues and many other complicated things. They may be more appropriate roles for FDA or CMS or somebody like that, but I don't see us particularly doing that at this time.

The doctors were just generally skeptical about the value of genetic testing. They did feel, mostly, that NIH should play an important role in providing information. There were some that thought we should just stay the heck out of it, that this is really an issue between the doctors and their patients and we should just be quiet. We will see how that goes.

Here is how we are not going to be quiet. Here is what we are thinking about doing. There were some recommendations that came out of the study, and then here are some ideas that we are developing right now to see how this could actually go.

The recommendations from the NCI study were that the information clearly had to be basic and practical, it had to be all about genetic testing, and it had to be very straightforward. We needed to develop it for different audiences. Certainly the public, but we really needed to be generating information for our professional audiences because they need a place that they can go for good stuff, too.

We needed to explain direct-to-consumer testing clearly. We should probably include genetic testing on the

website, and we need to do basic, good standards for utility testing and stuff like that.

The assumption that we are going in with, or maybe I should say the assumption I'm going in with, since I'm charged with basically building this thing, is that consumers don't care. They are really disinterested in this subject, until they are interested. For the most part, we Americans are bombarded with messages, thousands of messages a day, and we filter them all out and ignore them until we get converted into information-seeking behavior. There are lots of studies about that around health information.

I think what we need to be doing is creating an authoritative, reliable, unbiased resource that people can go to when they get converted into that information-seeking mode. What we probably need to do is market the availability of that information when they want it.

If something comes up, like my kid gets sick or my parent is sick, or my sister, I want to know whether this is going to run in the family. I remember, "Oh yeah, those government guys, they have something out there that I can go find this."

The good thing about the way search engines are working these days is that government sites are preferentially listed above commercial sites. We will bubble up to the top pretty quick, and people shouldn't have too much difficulty finding information that we put on the Web.

We are focusing on the Web because the people who are using this and seeking this information are very Web-savvy. Things are being marketed on the Web. This tends to be a more affluent group. We are not worried at this time, although we may get to that, about reaching further out into the world where people aren't using the Web and trying to reach those audiences as well.

The other thing that we are thinking about doing in this Web 2.0 world, which is overused and much hyped, is the social marketing of it all. We think this site needs to be engaging. The government, from my point of view, does lots of Web blogs. We create all kinds of content and put it on the Web. That is what a Web blogger does. They write something and put it on the Web.

What the government really doesn't do well is listen. We don't listen to the users and we don't want to

take the time to try to sort it out and have a conversation with our audience. We want to try to do that with this site. That is what we are thinking of doing.

We might want to take that even a step further. What I'm going to try to push, besides blogging this whole subsite, is to do a video blog on it. A video blog is basically just, instead of writing something, we bring somebody into a room, sit them down, do an interview with them, put a webcast up on the site, and the information becomes quickly available.

It is easy for us to do those. We can do that fairly quickly. My institute right now is trying to create a small interview studio so that we can test this idea and push this along.

It is easier in some ways for the audience to take this information in because all they have to do is sit there and watch TV, basically, on the Web. I have worked in broadcasting as a journalist. Television is automatically less dense. You just can't get as much information in television as you can in print. We will have to supplement with some text, but generally, it is a stream of consciousness way of getting information across.

It will be done in a Q&A kind of format.

There are challenges. We have to be 508-compliant. Closed captioning costs money. It has to be done quickly. We will definitely be working to put those resources in place. The other challenge, of course, will be finding experts across NIH, and wherever else we draw them in from, who can speak in a way that my mother can understand. She yells at me for not being understandable, but we will have to try to get there so that the information is accessible.

There are some other challenges. There is no budget for this. Like so many trans-NIH efforts, we are dependent on the kindness of colleagues. Right now people have been volunteering like crazy and it has been really great.

There is no dedicated staff for this. All the people that are working on this, including myself, are volunteers for it, and we are all hyper-busy, but there is a strong sense that this is important and it should be done.

This is a rapidly changing field, so we are going to need a group that monitors and keeps up as this goes

along. I am almost certain that I'm going to make mistakes as we are doing this, but I think that it will be an interesting exploratory process. If there is a conversation with our audience about it, I'm not as worried about making mistakes because we will talk about it. We will sort it out with that community of people who are interested in all of this. Overall, I'm optimistic that this will actually be helpful.

I will tell you one more thing in closing. An interesting note is, we were using a shorthand to refer to this and we were calling it Gene Scan. We were thinking about calling the site GeneScan.NIH.gov. We tested that when we had the consumers in the group, and they said, don't do that. They said it sounds like "scam." That was a New Yorker, so that is not too surprising.

[Laughter.]

MR. THOMPSON: The general sense was that this was something that was going to be cursory. It was not going to be in-depth and we would just gloss over it.

So we are still working on a name. If you have any good ideas, I'm all ears. I would be happy to take questions.

MS. AU: I think Marc has a question or comment. Maybe Lyla can start moving up to the podium.

Question-and-Answer Session

DR. WILLIAMS: I like the idea of the videos. One thing that you might consider, given all the constraints that you previously mentioned, is that Dartmouth has published on shared medical decision-making using videos where you basically have patients relating stories to patients about a choice. I think the one that they studied most extensively was on benign prostate hypertrophy and the different interventions.

I think that this would be a great opportunity to have people tell stories about why they chose to be tested, why they chose not to be tested, why they chose to tell or not to tell their doctor.

I think, as you well know, being a journalist, we relate to stories much better than we relate to anything else. This might be a really cool opportunity to test how that would work in this setting.

MR. THOMPSON: We have been thinking about how do you have the dialogue on a government site and who do you let in. You can't just let people post whatever they want

to. It has to be vetted. There are some HHS policies already about that.

I do like the idea. I'm a little bit of a geek and I go on websites where there are technical discussions all the time, and people tell each other stuff all the time. I want to figure out how to enable that in this site as well. I think that is really important. Thank you.

MS. AU: We will have more time to ask Larry questions at the end. Our next speaker comes to us from the Institute of Medicine, where she is a senior program officer. She is going to be telling us about the plans for the National Academies Direct-To-Consumer Genetic Testing Workshop.

Plans for the National Academies DTC Workshop

Lyla Hernandez, M.P.H.

[PowerPoint presentation.]

DR. HERNANDEZ: You all know how important direct-to-consumer genetic testing is an issue. It is consuming a lot of our time and effort these days. Several different segments of the National Academies felt it was important enough that, unlike when we are all trying to get our own projects going in our little areas, we thought it

was very important to take an Academy-wide look at direct-to-consumer genetic testing.

Several of us got together, including the NAS Committee on Science, Technology, and Law, the National Academy of Science Board on Life Sciences, the Institute of Medicine Roundtable on Translating Genomics, the Drug Forum, the National Cancer Policy Forum, and we went to the presidents of the Academies and the Institute of Medicine and asked them for money to put together an Academy-wide workshop that would look at the kinds of issues that are of concern to various segments of the Academies in this whole area.

We have a Workshop Planning Committee that is composed of representatives that come from each of the segments of the Academies that is participating with the Genomics Roundtable, which is what I direct. We have Kathy Hudson and Muin Khoury, and I know you all know them. These are the rest of our members.

The goal of the project is actually to bring together numerous stakeholders -- something we all try to do these days -- including scientific, medical, legal, and policy communities, and the public, to look at issues,

opportunities, and challenges in this whole area.

We have four areas of emphasis. We are going to briefly try to get a handle on the current state of the knowledge and a future research trajectory in this area; shared genes and emerging issues in privacy, which you talked about this morning; the regulatory framework in DTC genetic testing; and then education, or communication and understanding I guess one would say, of the public and the medical community.

We were asking certain questions in the knowledge and research trajectory area, including the current status, of course. What do we know about the analytical validity and the clinical utility of these tests. Can we learn anything from these tests; if so, what. What will not be learned from these kinds of tests. What can we anticipate the future is going to look like in terms of the genetic tests that come online that will be available in the next five to 10 years. What is the market going to look like. Those are the kinds of questions we are exploring in the first session.

Our second session will look at shared genes and the emerging issues in privacy. One of the things that the

planning group was particularly interested in is can we balance this consumer -- and now we know it is a small percentage of consumers -- desire to know with the need to protect and the need to guide. What are the risks and benefits for family members who use these tests; for public figures, if they choose to use them; for the legal system.

A big question is, who owns the individual's genomic data. There is the issue of discrimination and effectiveness of GINA. There is an emerging online social networking system that is based on these direct-to-consumer genetic testing results, and we want to explore that a bit.

There are many regulatory framework issues. I'm going to let you read the slide rather than reading it to you. Perhaps that will help speed us along so we aren't as far behind. I'm sure you have a copy.

A big area is what do we know about what the public knows and what the provider community knows, and what kind of providers are we talking about. Primary care is very different than pediatrics, which is very different than obstetrics and gynecology in terms of the level of knowledge about certain kinds of genetic tests.

How do we ensure that those who take these DTC

tests get proper interpretation. Are there mechanisms or innovative models that could be used to help that. What is the minimum knowledge required. What kind of lessons have we learned from other diagnostic tests and procedures.

We have not scheduled a date. We have had two planning committee conference calls. We hope to have another one in the near future and finalize the agenda, but we hope to hold the workshop in the late summer or early fall. You can contact either Anne-Marie Mazza or myself for more information. Thank you.

MS. AU: Do we have any questions or comments for Lyla?

[No response.]

MS. AU: Thank you, Lyla. Our next speaker is Amy Miller. She is the public policy director for the Personalized Medicine Coalition. She will be talking to us about Standards for Analytical Validity and Clinical Validity of Genomic Scans.

Standards for Analytical Validity and Clinical Validity of Genomic Scans

Amy Miller, Ph.D.

[PowerPoint presentation.]

DR. MILLER: Thank you for inviting me to speak today. I would like to run through some Personalized Medicine Coalition efforts in this space.

First of all, who are we. We are interested in personalized medicine as a large concept in the future of health care. We represent all the different stakeholder groups in personalized medicine. That includes pharmaceutical companies, diagnostic companies, lab service companies, the academics who do the initial research, and the medical centers who put it into practice.

Here is a handy little diagram about we see ourselves. As you can see here, healthcare providers and patient groups are members of our organization.

You heard a little bit about the HHS, NIH, and CDC efforts in consumer genomics, and through those conversations there were some concerns that maybe the results weren't similar when people got the three different scans. The companies, before this became a very public concern, hadn't really talked with each other.

During the HHS and SACGHS efforts over the summer of 2008, three gene scan companies: 23andMe; deCODE; and Navigenics; along with DNA Direct, came together and said

it would be a good idea if we got together, talked about our products, and talked about how to get them a little more aligned.

DNA Direct, for those of you who don't know, is a longstanding direct-to-consumer genetic testing organization that does tests that usually you get through your physician. There is a physician who orders the tests, and the results are transmitted through a genetic counselor. DNA Direct has long been a member of the PMC and a leader in this field, and that is why Ryan Phelan in particular was involved in this conversation, but they don't do gene scans.

These three companies that do gene scans came together and said let's try to get our tests aligned so that when a journalist gets them all done they do get the same results. Through that effort they came to adjust their algorithms in some ways so that the results are more similar. They also recognized that transparency would be very helpful to the community.

This is actually a link to the CDC's website, but it is also on the PMC webpage. This link, and what is in your book, is a four-page overview of the workgroup's

efforts. The companies have recognized how important transparency is, and in the fourth page you will see links to the transparency pages of the three companies, where they go through how they calculate risk.

They have also pointed out some areas where it would be helpful to have the government say what would be useful. So, where is the consensus on how to calculate risk, or where is the consensus on when to include a SNP in results communication. These are some open questions that the companies themselves recognize.

Now, PMC is partly an educational organization, educating whomever about personalized medicine. Since these organizations have gotten so much attention publicly in the media, we thought it would be very useful if some organization came up with some educational materials. To do that, we hired, frankly, Scott Boyle, who used to work at HHS and has since returned to academe, to help us write a consumer guide.

We also wanted patients and providers to have some input into this consumer guide, so we drafted a document and sent it to our Public Policy Committee at PMC. Some of you in this room actually took part in editing the

guide there. We also sent it through our Science Committee. Some of you are also there. We shipped it around to some federal friends and received feedback there.

Then we sent it to the community and asked for feedback, and hosted a roundtable, where we asked patients and providers to read the document, to listen to companies present their products, and to give open and honest feedback about what kinds of information they want, how they would like it to be presented, what are some cautions they see in the products, and what are some benefits they see in the products.

PMC went into this event blindfolded. We didn't really have any expectations for outcomes. What was most surprising to me is that when we presented the guide -- which is in your books, and for the rest of you is available in its entirety on this website -- the consumer groups represented in the room said we would like this guide to be redone for our needs. So I said, take it. If you want to take the content in this and expand on certain aspects and contract certain other aspects and remodel it for your own use, please do.

I was listening with rapt attention to the NIH

gentleman who before me. There is a need for that. There is a need for an educational, government-wide effort. It should be focused on different kinds of groups as well. We heard it loud and clear from our consumer effort.

Now, in terms of going forward, as PMC received feedback on that very large guide we incorporated that feedback. The guide just grew and grew. We do hope to do a small educational brochure. We have some history of doing that before, and we hope to get one out soon. There is still, I think, a thirst for knowledge in this space.

MS. AU: Do we have any questions or comments for Amy?

[No response.]

MS. AU: Thank you, Amy.

DR. MILLER: Thank you.

MS. AU: Our next speaker is well known to the Committee because we keep inviting her back over and over again to give us great feedback. Anne Willey comes to us from the New York State Department of Health, where she is the director of the Office of Laboratory Policy and Planning. She is going to be telling us what is going on in that great State of New York.

New York State Laboratory Requirements Relevant to Genomic Services

Anne Willey, Ph.D., J.D.

[PowerPoint presentation.]

DR. WILLEY: Thanks for having me back again. I understand there are some new members of the Committee, and so very briefly I am going to just review the New York State oversight of clinical laboratories. I will emphasize again, as I have repeatedly before, this system operates for all laboratory testing in New York. It is not unique to genetics, but all genetic testing is subject to this system.

The statute in New York State preexists all federal statutes regarding oversight of clinical labs, having been passed in 1964. It requires all laboratories testing any specimen derived from the human body collected within the geographic jurisdiction of New York to have a permit from the New York State Department of Health, regardless of any other permit, regardless of any other accreditation.

The criteria for issuance of a permit requires that the lab director be qualified, that they submit an

application and they pay us money, that the facility be inspected, that every assay they offer is either generally accepted -- that generally means FDA-cleared -- and approved by the New York State Department of Health, which means we have a rigorous review with assay validation, and they have to comply with any other state statutes.

Directors have to have a doctoral degree and four years post-doctoral experience. Two of those four years must be in the specialty, in this case genetics, and that experience must be within the last six years.

The lab submits an application in which we review their ownership and financial interests, the physical facility layout and equipment, who is working in the lab, and what tests they intend to offer. Their initial fee is $1,100. It is then a percentage of their revenue. For some large major labs, this means they pay us over $1 million a year.

There is an on-site physical inspection of every facility. We go internationally to Hong Kong, the United Kingdom, and Iceland.

Every assay that they offer must be reviewed for its validity. That includes a specific assay description,

a suitable guide that will be used by the person ordering the test, and an explanation of their consent process. New York State is a state that believes in genetic exceptionalism and has a specific statute in the civil rights law that explicitly requires written informed consent for all genetic tests. That is DNA, RNA, chromosomes, gene product, and/or product of gene product, for inherited traits. We are looking at germ-line mutation defined as genetic. It includes specifically DNA profiling.

We review analytical validity, and I will generally agree with some comments made earlier that this is probably the easiest element for the laboratories to document. That doesn't mean we don't review it. We look at their actual data and their claims, their cutoff values and their error rates, and their precision, accuracy, and reproducibility, but it is their ability to detect and/or measure whatever that target is, be it the DNA sequence, the enzyme activity, whatever it is they are claiming.

We also review clinical validity, but this is generally documented by literature references. It is the documented association of the analytical target with some

clinical condition or outcome or component of the biological specimen. New York State includes under its laboratory licensure program things beyond the CLIA definition of a clinical lab so that genetic profiling, paternity, forensics identity, and hobby genetics, if you will, are subject to oversight because it is a specimen and it is the measure of a component in that specimen.

We also review their reporting format. In genetics we require that that be in a format suitable for a non-geneticist.

Some of the other statutes become of issue, particularly when we are talking about the kind of direct-to-consumer marketing of genomic profiles. New York State is not a direct-access state. Individuals cannot order their own lab tests, with some very, very specific exceptions.

Therefore, every test, if it is performed by a permitted lab, is only performed at the request of a person authorized by law to make use of those test results. In the case of most genetic tests, that would be the clinician, generally a physician. Genetic counselors are not licensed healthcare practitioners and cannot order lab

tests in New York State. It may be a lawyer in certain legal circumstances, such as paternity, identity, forensics.

Laboratories must report the results only to the person who orders the test, and they may communicate those results, which must be an exact copy of what was reported to the authorized person, to the patient or person tested only with written authorization of the ordering person.

We also have lots of business practice rules for laboratories, including direct billing laws. Laboratories must bill the person tested or their insurance, with authorization. This to avoid middle men who mark up charges or add on services that may or may not be appropriately attached to the lab test.

There is a provider-to-provider exception between permitted labs. When a specimen goes off to one lab, that lab doesn't do the test, they refer it to another lab. The first lab can bill for it and pay the second lab.

Facilitators, intermediate marketers, and Internet facilitators cannot receive funds on behalf of a person tested to pay for the lab test. If they are arranging tests, which we have mentioned DNA Direct does,

then the lab that does the test has to bill the person who is tested. DNA Direct can bill the person for the medical services they provide but they cannot be the pass-through for the money.

There are some very rigid anti-kickback statutes in New York State. There may be no fiscal or other incentives provided by a licensed laboratory or other entity to the ordering practitioner. You can't pay them a fee, you can't employ them, you can't put them under contract, and perhaps more specifically, the laboratory cannot provide services to the person tested that would otherwise be provided by the practitioner.

Laboratories cannot provide genetic counseling for the persons they test. They can provide genetic counseling education to the physician who orders the test, and they can provide a copy of the test result if the physician authorizes them to do so, but the laboratory cannot practice medicine. Genetic counseling is considered the practice of medicine.

Under state education law, the license of a physician prohibits that physician from being an employee of a corporation. Corporations cannot practice medicine.

Laboratories can't practice medicine, laboratories can't employ physicians who practice medicine, and physician groups have to be careful as to how they incorporate under New York State law.

Now, I'm asked how this works for the entities that are offering direct-to-consumer testing. I tried to be creative. I have learned a great deal. I can now draw arrows in PowerPoint.

[Laughter.]

DR. WILLEY: Education and information flows relatively freely. The one place we need to be careful is between the laboratory and the tested person. The tested person can provide information to the laboratory, but the laboratory can only communicate with the tested person in anything other than generic webpages or information or educational materials at the authorization of a physician.

There is an arrow missing on the slide between the laboratory and the authorized person or the physician. We want the labs to educate the practitioners about the tests that are available.

Within the different components of a laboratory, those who collect the specimen, those who perform the

analysis, those who interpret the data, we expect appropriate exchanges of information.

There are these facilitators or marketing firms out there who can share information with physicians, share information with patients, and get information from the laboratory. That is another arrow missing from the slide. You will see it gets complicated enough.

We want a free education. We want free information, with one caution, that being between the lab and the person.

You will also note down here under the laboratory I have indicated three different components. We believe that it is consistent to say that these entities that will obtain raw data from the analytical testing facility and generate a report that would go to the ordering practitioner are laboratories. Making them laboratories creates the provider-to-provider exception regarding financial arrangements. It creates an appropriate provider-to-provider exception for exchange of patient information. It facilitates the kinds of activities that corporations like, if we will, the big four wish to engage in.

Making them laboratories does subject them to an inspection, the naming of a director, paying of a fee, and participating in whatever oversight and submission of data we require, but we believe it is also consistent with the CLIA requirement that says that the pathologist who receives the slides or the images from the analytical facility and issues an interpretive diagnosis on a Pap smear must be licensed as a lab. We consider these data management facilities no different than that entity in pathology. So we are making these data management companies laboratories.

Information flows freely. There must be a written informed consent, and the statute specifies eight elements. Four of those elements can only be described by the lab: what test are you going to do, what is the predictive value of the test, what are you going to do with the specimen, and those kinds of things. The lab has to provide to the physician half of the information for the consent.

The physician is the only one who knows why they are doing the test, what it is going to mean for the patient, and they are the ones who have access to the

signature of the patient. The actual execution of the consent, the turquoise line on the slide, occurs between the ordering physician and the patient.

The laboratory can get a copy of that consent. They are not required to have a copy. The physician who orders the test must retain the written informed consent.

Money. The tested person must pay the lab. The tested person presumably pays the authorizing physician for their medical consult. The authorizing physician could pay a facilitator in exchange for information. That is that educational piece, that CME piece.

The laboratory could contract with that marketing entity for the distribution of educational materials. As between the components of the lab, they can exchange money. One entity gets all the money, they pay all the parts. The laboratory can give no money and no incentive to the authorizing physician.

The report is the white lines on the slide. The laboratory reports to the ordering physician. The ordering physician interprets and provides some results to the tested person. If the physician authorizes the laboratory to give a copy of that report to the patient, that can

happen.

Adding in the two arrows I left out, when we try to explain the business practice criteria that we use to review these, we are looking at all of those various components in agreeing to approve one of these entities.

We monitor the Internet for marketers of lab tests. Genetic tests are just one of the types of tests we monitor. We have sent to approximately 40 entities, since 2004, letters that say not in New York unless you have a permit.

I was asked to report on what the responses to those letters have been. I have copies of all the letters that went and copies of all the responses that came back. There are approximately 40 because the companies morph. They change from one into three and then they combine.

Anyway, we have had no response from eight. They tend to be small entities. They come and go on the Internet. There were eight that did not respond.

There were 12 that responded, we understand, we know you have rules, we won't do it in New York, and they put disclaimers on their websites that say not in New York.

We have five that said, we know you have rules,

we think we are going to apply for a permit, but we won't take specimens from New York until we get our permit.

We have five that we still need to follow up. They are in that category. They do need a permit and we need to get them into the system.

We have three that we have determined do not fall under our jurisdiction because you have to travel to that facility in order to have the specimen collected and that facility is not in New York. Therefore they are not in our jurisdiction, or they are not a laboratory. They are the practice of medicine, they are not performing any tests. That is three of them.

We have the biggies. Three have applied. One we have determined is not a lab. The remaining one is still in negotiations regarding the requirement for a physician's order and whether there are any options under the New York State statute.

I would be happy to take questions.

MS. AU: While we are asking Anne questions, if I can have the other speakers start moving to the front so we can do the panel. Yes, Jim.

Question-and-Answer Session

DR. EVANS: I will ask the obvious question, Anne. You left us with the three biggies and you had determined that one was not a lab.

DR. WILLEY: DNA Direct is the practice of medical genetics. They facilitate the testing, but they do not do any testing. They have accommodated the New York State direct billing law. The Department of Education has cautioned them regarding the corporate structure under which the New York-licensed physicians provide the medical services, but that is not a laboratory issue.

DR. EVANS: Where do things stand with the large labs like 23andMe in getting this? At least one of them says, we have a physician that orders the tests, but that would seem to be in conflict with your rules.

DR. WILLEY: It is.

DR. EVANS: So they would not be eligible to do this on specimens collected in New York.

DR. WILLEY: Not if there is any financial arrangement with that physician.

DR. WILLEY: Julio.

DR. LICINIO: My question was, I have been reading about how people have these DNA parties where

everybody goes and collects samples.

DR. WILLEY: Those specimens were destroyed.

DR. LICINIO: Yes, but let's say I am not a resident of New York and I go to such a party, and the test is sent outside of New York. So I don't reside in New York, the test does not happen in New York, but I happen to be in New York for the collection, is that legal or illegal to you?

DR. WILLEY: If the specimen is collected in the geographic boundaries of New York State, then the laboratory that performs the test is subject to the jurisdiction of the State of New York. It is not that far to Connecticut.

MS. AU: We won't tell the governor, Anne. Any other questions for Anne right now?

DR. WILLEY: The answer to your question is no, no labs are approved in New York State to offer whole genome scans. Some of you may know that in the last two weeks we have approved three laboratories to do array-based genome scans, but those are for specific genetic conditions which are confirmed by cytogenetic fish.

MS. AU: Why don't we have all the speakers come

up to the front. Do any of the Committee have questions or comments for any of the speakers today? Jim, do you have a question?

DR. EVANS: This would really be for all of you. As I was listening, one thing that I was struck by was a fair amount of discussion about analytical validity and a fair amount of discussion about clinical validity. I think, as a practitioner and as a patient, is that what is most important is what those two concepts are subservient to ultimately, which is clinical utility. I'm just wondering what your thoughts are about clinical utility because I didn't hear much about that.

Anne, you are the only one who I think was clear on that. It doesn't fall under your jurisdiction, really.

DR. WILLEY: To make it clear, if a laboratory includes in their report something which verges on claims or patient-specific recommendations. It's one thing to have educational material on the website that says if you have this test and we find these markers, people with those markers may have these increased risks. That is educational material.

After the test has been done and you are saying

to the patient, "You have these markers. These markers are found in individuals at increased risk of," the laboratory cannot then say, "Therefore you should take this drug or have this test." Laboratories can't do that. The utility, what you do with this information, is left to the practitioner who ordered the test.

Committee Discussion of Issues and Next Steps

DR. EVANS: I'm interested in where that concept falls for the rest of you.

DR. FEERO: I will first comment from the standpoint of the meeting that I talked about. I think that utility was definitely part of the discussion at the meeting. It is obviously a very difficult thing to define. It is very, very hard to define. It is quite hard to measure. It takes a lot of time and effort.

I think a lot of the meeting actually focused on the need for adequate clinical validity before you can get to really addressing in big studies the clinical utility issue. If the SNPs aren't predictive of risk in all the populations you want to include in a large utility study, you can't do the study.

As anybody knows who has heard me speak before,

utility is near and dear to my heart as an issue. I think you cannot neglect that lens for these applications.

DR. MILLER: I was about to answer very similarly. Just to add on to that, because clinical utility is so hard to define one unintended consequence of these companies coming forward is that consumers know a whole lot more now about what genes mean to their health. I think they are also starting to learn a bit more about probability. That is an unintended but perhaps positive consequence. It is adding to what consumers understand.

DR. EVANS: I'm actually skeptical that there is an increased understanding of any real appreciation for probability and utility.

DR. MILLER: I don't have any data to back up what I said.

DR. EVANS: Right. That is my next question. I don't think there are data to suggest that.

DR. FEERO: I would say that a definite benefit has been an increase in the dialogue and also the sense of urgency to address the issue. These companies I think have done a service in that respect to propel the discussions that need to happen as these technologies are becoming more

and more viable for healthcare applications.

MS. AU: Christy, are you still on the phone?

MS. WHITE: I'm here.

MS. AU: Do you have that information for Dr. Dale?

MS. WHITE: I do. I know there was some discussion with the last speaker about that in terms of the ability for people to retain information.

The way it was worded actually is, "What should happen to your DNA sample after the test is complete?" and 46 percent said, "Retain the DNA sample for future tests of my choosing." When we asked them who they would want to keep the DNA, the vast majority of them, two-thirds, said that they would want it to be kept by the company that conducted the test. Very few said a private medical storage company. Less than one in 10 said that a government agency should have that information. No offense to anyone in the room.

MS. AU: Andrea.

DR. FERREIRA-GONZALEZ: Did you also ask them about not only retaining the specimen but if we can use it for further testing or for other purposes?

MS. WHITE: We did have another attitudinal question at some point that didn't ask them if they would want it but were they concerned that that would happen. I think something like two-thirds of people said they were very concerned that their test may be used without their permission. While we didn't ask that exact question, from a lot of the qualitative research we have done I would say absolutely they do not want that information to be used except by their own choosing and for a specific test that they would indicate.

MS. AU: Gwen.

MS. DARIEN: Hi, Christy. It is Gwen Darien. I have a question. You asked it one way, but one of my colleagues, who is an OB/GYN and bioethicist, did a survey and asked the question in a different way. The question was how people would feel about having their embryos used for research if it would help forward medicine.

Overwhelmingly, the families that were asked said that they would be happy to have their embryos used for research and that they weren't using their discarded embryos.

It seems to me, that the way the question was

posed would lead people to answer the way that you answered it. In my mind, there would be some suspicion in the way the question was posed.

MS. WHITE: Right. Obviously, if you are giving people an altruistic reason to use the DNA you might see a different response. In this case it was really more the likely scenario, which is I have had a genetic test for my own purposes, I have had my DNA taken to tell me about a specific test I want, and I'm housing my DNA there for my own purposes in the future.

Certainly, if it is more mom and apple pie and it is served up in an altruistic manner, particularly among women as it relates to children or disease prevention in the future, I would imagine you would see an inflated response. Absolutely, the context is critical.

MS. DARIEN: I don't even think it is inflated. I think it is just flipped.

MS. WHITE: I don't mean erroneously inflated. I mean truly. Certainly you would have people responding differently depending upon what you were going to do with it.

Actually, in '06 we asked a couple of questions

about consumers' willingness to be part of a larger database that the government would have for very similar purposes, more for the greater good of the American public. We did see that there was definitely interest for consumers, but it wasn't as widespread as we would like to see, potentially.

MS. DARIEN: Was this done before or after the passage of GINA?

MS. WHITE: It was done a month after, which I found very interesting. If there had been any publicity, or to the extent to which there was media coverage about it, it was probably happening right around or, frankly, right before a flurry of communication, if you could call it that, about the passage. We probably were in the field where we would have expected to see the highest levels of awareness, and we basically saw absolutely no lift in awareness of protections from '06 to '08.

MS. AU: Paul.

DR. BILLINGS: I would like to ask for a couple of points of clarification about the New York State situation, which is complicated for my untutored mind. For instance, several of the national labs, who I believe

practice in New York State, employ genetic counselors. From what I think you said about the relationship between labs and counselors, does that mean that for samples collected in New York State the labs have not been using those counselors as part of the process?

DR. WILLEY: No, those counselors either provide education to the ordering physician or provide guidance to the ordering physician in interpreting the results.

DR. BILLINGS: They don't provide services direct to the consumer?

DR. WILLEY: With the written authorization of the ordering physician they can provide the service, which would repeat the result and explain what it means. By our criteria, that is probably not genetic counseling in its fullest extent.

Now, are those genetic counselors talking to patients who are tested in New York? Yes.

DR. BILLINGS: Yes, I know they are.

DR. WILLEY: But they are not supposed to be providing genetic counseling.

DR. BILLINGS: Second of all, as I understand your diagram, the result of a lab test cannot be provided

to the patient directly.

DR. WILLEY: No, with the written authorization of the physician it can.

DR. BILLINGS: Right. So, if a doctor orders a test and then goes out of town or on vacation and the person is waiting for their cancer test result, they have to wait until the doctor comes back?

DR. WILLEY: I believe it would be considered negligent medical practice if the physician did not make arrangements for that.

DR. BILLINGS: This leads to my question, then. It is a remarkably intricate and important regulatory network that you have set up. From New York's point of view, what is working well and what needs reform?

DR. WILLEY: From New York's point of view, to the extent that laboratories apply for permits, have their assays reviewed, get permission to offer the assay because its analytical validity and clinical validity have been documented to our satisfaction and we are happy -- and we look to other national organizations for what criteria should be used -- and we generate a list of not only the approved labs but the approved tests, that works well.

We also do have a mechanism by which a physician can make a request to use a lab that is not permitted for a particular patient for a particular clinical need, and we have never said no, so long as it is unique to that patient and a justifiable medical need. So you can use labs that don't have permits and you can use permitted labs that aren't approved to do a particular test if the clinician feels that is necessary.

That system works. What doesn't work, from our perspective, is that a patient can go to Connecticut and get the test. Unfortunately, that is true, and it argues that we are providing overkill.

Our program costs us $20 million to run. We do regulate 1,600 labs. We believe we regulate over 75 percent of all the genetic testing done in the country because all of the major labs are New York State-licensed. The courts look with great disfavor when it turns out the lab did not meet New York standards on a specimen from Connecticut because, after all, New York standards are more stringent and more rigorous than CLIA.

For the residents of New York State, our system is working. For New York State residents who choose to

avoid the system, there may be problems. I do believe there is really a problem for the rest of the country.

Just relevant to retention of specimens, because it has come up in terms of the genome profiles, New York State civil rights law requires a specimen be destroyed at 60 days unless the tested individual explicitly consents to its retention. It can be retained deidentified for unspecified research. If it is retained in an identified format or used for any genetics research, it must be an explicit genetics research consent.

The issue regarding genome scans has come up. What about the data? It is more efficient to run the full genome SNP profile using however many you can do at once. You have the DNA. You can get all the data now. You don't need to keep the specimen. That data is not yet clinically valid because we don't know what it means.

Can we keep the data and mine the data later? We have said yes, if the new analytical purpose of mining the data has been validated and if the patient's physician explicitly orders the new test. It gets very complicated.

DR. BILLINGS: It seems insurmountable.

MS. AU: I have Dr. Dale, Kevin, and Mike, and

then I think we need to move on.

DR. DALE: Go ahead.

MS. AU: Go ahead, Kevin.

DR. FITZGERALD: Of course, the questions are always too brief. Getting back to the personal utility issue, which I don't want to become too confused, obviously, one would hope, anything involving health care would have personal utility. My question is going to be, how are we going to try to put parameters around what we are doing and to what end. So, where does clinical utility come in as a bottom line, or is it the bottom line? If it isn't the bottom line, what kind of utility will be?

There is not only the possibility of personal utility, there is also public utility. If we are collecting this data and we are putting it in public databases, obviously government institutions can come in and claim the utility on their own to pursue their own ends.

DR. FEERO: I will try to tackle that. I think it depends a lot on what the desired end product is. I would think if you were a payer for health insurance, clinical utility would be largely what you were thinking

about. If you were a regulatory authority trying to decide whether you should be able to offer these tests, period, you would probably have to look at some sort of aggregate measure of its overall worth rather than simply saying clinical utility.

Let's just say some state decided to say no, you can't offer genome-wide scans. To make that decision I would think they would have to look not only at clinical utility but at personal utility or some other, more nebulous measure of whether or not for an individual consumer this has value beyond the way the doctor, the P.A., or the nurse practitioner is going to use the information in a clinical setting.

I think it very much matters in what window. To me, it would make sense to explore moving to a broader definition and a very narrow view of clinical utility for the majority of these discussions when we are talking about it from a societal perspective.

DR. MILLER: I think some individuals would argue that they can themselves decide if there is some utility. Some people without a family health history, for example, may find they have a personal utility for this information

that otherwise may not be.

DR. FITZGERALD: Right. I guess that then gets back to what we see as the ultimate utility of this information. Is this just another commodity for people to buy, like a car, or is this in some way different because it has to do with health care. Again, it is this intersection of things. That is why I'm curious to see where you see things going and where you see the line.

DR. FEERO: I would tell you to look around at other healthcare applications for models of what you can access and what you can't access. Don't use a genetic exceptionalist perspective on this. You can go out and buy a lot of things that don't make a lot of sense in our healthcare system right now.

I think a big question that all of us should be asking is, is genetics so different that we should be holding it to a higher standard. I would argue that we should at least entertain that because its applications are so broad and potentially costly to healthcare systems.

MS. AU: I think Mike and Jim are dying to jump in on this.

DR. AMOS: As far as the process, the next part

of the agenda is to get into next steps and action items. Considering the fact that our panelists have thought about this a lot, before they go sit down and we lose them would it be appropriate to ask you what you think we should recommend to the Secretary as to what the next steps should be with regard to direct-to-consumer testing?

We might be learning something from the research that is being done by these companies, but maybe not. I'm still unclear. Is there the potential for things to be learned, or would we be throwing the baby out with the bath water if we shut everything down?

DR. TEUTSCH: Let me recast that. You can advise us on things that we might want to take up rather than specific recommendations. What are the areas that we should be looking at that would add to the utility for the Secretary?

DR. MILLER: When PMC was doing our work, we just had the same conversation time and again. This is early. We are talking about SNP technology and CHIP technology. Soon, meaning five years from now at the most, the technology is going to be completely different. There is a baby-and-bath-water issue. There is also a horse-out-of-

the-barn issue, and I'm sure I could come up with some more picturesque speech if I thought about it. So I would suggest that this Committee look forward no matter what you do.

MS. AU: Jim.

DR. EVANS: I just wanted to try to put in perspective this issue of utility. I think that one of the things that we all have to recognize is that robust genomic analysis is definitely going to exist, probably predominantly outside of the traditional medical model and outside of the Academy. Therefore, I think when we get to issues of utility, Mike's admonition -- or maybe, Paul, it was your comment -- about personal utility perhaps having some merit is well taken.

I think what we have to do in that context is reconcile claims that are made with utility. In other words, if laboratories are going to, either de facto or explicitly, make medical claims, then they have to be held to traditional models of clinical utility. If they choose to market their products as entertainment or as hobbies, fine. Then people are free to interpret their own personal utility, but they then cannot make medical claims.

I think what is really important is that we have some reconciliation between the claims that are made and what is actually being offered.

DR. MILLER: Greg could probably answer this even better than I can, but I will take a stab at it. At the CDC-NIH event, one of the roundtable participants said the big three -- 23andMe, Navigenics, and deCODE Genetics -- are talking to federal regulators, SACGHS, and federal researchers and regulators, and there are some companies who aren't. So I think these companies are cautious about making medical claims.

DR. EVANS: Actually, they are making medical claims. I think that is obvious in their websites and their advertising. That is where I think we need some reconciliation.

DR. FEERO: I think that is the real challenge, the explicit versus the implicit claim of clinical usefulness. I don't have a solid sense as to how you can deal with that in the current environment beyond being fairly draconian about what SNPs you are using.

MR. THOMPSON: Can I just respond to that really briefly? I think that the answer ultimately is that

however you define the policy side of clinical utility, it is really wise to keep a close eye on the science side of it. NIH sponsored a conference about a month and a half ago called the Dark Matter of the Genome. Basically, we were trying to figure out where all the inheritance is. There is all this SNP stuff being done and these genome-wide studies being done, and we are not seeing the amount of inheritance that would be expected.

There are a lot of unanswered questions out there. For companies to be making claims about anything, it is making the people around me go, "What the?" I think that is an important, ground-based reality question. Stay close to the science.

DR. FEERO: I would like to go to the question about what some of the next steps are. I think that one of the things that this Committee could help to do is to focus HHS's attention on the need for a very considered and thoughtful approach to the issue of translational research in this area.

I think that it is clear that the prime mission of most of the research is in the early discovery phase. That is probably very justified. It is exceedingly

justified. Just as we had a focus on ELSI early on in this topic area, I think we are moving to a stage where maybe there should be an increased emphasis, similar to ELSI, on making sure that the movement to clinical application is done in a careful and considered way.

DR. BILLINGS: I just wanted to point out, to Jim's comment, that blood groups have been measured and have an important clinical utility in transfusion and transplantation. Yet there are cultures that use blood group information for all sorts of things.

DR. EVANS: That doesn't mean that they are correct.

DR. BILLINGS: They are what they are.

DR. EVANS: What I'm saying is we should not be in the business of promulgating myths.

DR. WILLIAMS: I wanted to respond to Jim's point. I'm not sure that I actually heard him right, but this was also true in the information from PMC, if I'm not mistaken. It seems to me that there is an attempt to create an island of sorts by using terms like "informational." In other words, there is recreational testing, there is medical testing, and then there is

informational testing, which seems to relate to some of this issue about personal utility.

I recognize that some of this reflects the rugged individualism of the American people, but I would be reluctant to let the company define where it wants to sit. I think we would then be in the same sort of situation we are currently in with nutriceuticals and alternative medicine, which is if you claim "I'm nutritional and I'm not a drug," you are exempted from a tremendous amount of regulation. Yet we have very good examples that in fact the harm may be quite more substantial than what we have in the pharmaceutical industry.

I think we have to be cautious about creating safe harbors by using some of the language imprecisely.

DR. TEUTSCH: Let me thank all the panelists. You have obviously sparked an interesting discussion that we need to grapple with. So, many thanks. Chances are, we will get back to you.

MS. AU: Thank you. Thank you, Christy.

[Applause.]

DR. TEUTSCH: Having heard all of this, do you have some suggestions for how we proceed?

Proposal for Short-Term Action

Sylvia Au, M.S., CGC

[PowerPoint presentation.]

MS. AU: The next section is going to be a proposal for short-term action for the Committee. The proposal for the short-term action is that we develop a brief document that reviews the concerns about direct-to-consumer testing, such as limited data on clinical validity and utility of tests, consumer and provider understanding of test results, privacy protection, companies that skirt oversight regulations, and false and misleading claims.

The reason we picked those right now is because we have recommendations from SACGHS on them. Instead of making new recommendations, this would be taking recommendations we already have to address these issues and then recommending other action steps for maybe a more in-depth report or other action. Keep in mind this is a short-term action step.

When we went through the recommendations, which all Committee members should have memorized and tattooed on your body -- new members should have that done as soon as possible -- we found that there were two recommendations

that would deal with the clinical validity and utility data recommendation, three recommendations that dealt with consumer and provider education, one recommendation that dealt with privacy protection, and one recommendation that dealt with false and misleading claims.

I'm not going to read all these recommendations to you, but as I was reading them again, I realized we are a very wordy bunch.

The first recommendation that Cathy and I think has to do with some of these direct-to-consumer issues is the FDA evaluation of lab tests. I'm sure our FDA colleague is very happy to hear that we are bringing that up again, since they were so happy to hear that the last time.

Continuing on with the clinical validity recommendation, we have recommendations for creating the public-private workgroup, developing criteria for risk stratification and how to apply the criteria, and also that lovely mandatory test registry.

Following that, we have another recommendation about a public-private group of stakeholders to assess clinical utility, which we have been discussing today.

That is a very long recommendation that goes on for three slides.

We also have recommendations on funding clinical utility research and how to disseminate that information to the public so they can use it.

Education recommendations that we have are that public and private entities should address knowledge deficiencies and the need to train and educate healthcare providers with appropriate funding, resources, et cetera. That recommendation continues with having additional funding for education and training.

We also have a recommendation that education resources are made available on websites to help consumers make informed decisions about their health care.

We had that regulation that CMS loves about CLIA oversight and privacy protections. Then we have the regulation, again, that we had put up to address false and misleading claims and to regulate marketing of direct-to-consumer genetic testing.

Those were the seven recommendations that Cathy and I could come up with. Of course, there could be other ones that we could come up with. All of them are actually

at the back of the progress report that is included in your briefing book if you want to start memorizing them now.

Our next step, if the Committee decides that we want to take this action step, is to form a small short-term task force -- "short-term" meaning less than three years long -- to develop a really fast report. This area seems to be in the news a lot, so we can highlight some of these existing recommendations that we have had for so long. Then we can also have the short-term task force look at what issues have not been addressed by our prior recommendations, and what further work might need to be done.

Committee Discussion

DR. TEUTSCH: Great. Andrea, did you want to comment?

DR. FERREIRA-GONZALEZ: The idea is that we will develop a brief report where we are specifically addressing direct-to-consumer issues and then pulling from the previous reports' issues. So we will be highlighting that we are concerned about direct-to-consumer testing.

MS. AU: Yes. Then we can also put what issues we need further study on, because we are not going to do

this in-depth four-year report that we do all the time.

DR. FERREIRA-GONZALEZ: I think I like the idea. I think it needs to be separately addressed, even though we have addressed it in other reports.

DR. TEUTSCH: I would be curious about whether we are monitoring the relative success of these enterprises. The fact that they get a lot of coverage in the media doesn't indicate that they are necessarily flying off the shelf in terms of their popularity. I wonder whether that data might frame some of the issues or the amount of money being spent.

One of the things we saw in this panel is that here in Washington a lot of money is being spent on DTC genetic testing. I'm not sure it deserves it.

MS. AU: I think that is one of the issues the small, short-term task force needs to look at, whether it is actually happening. I don't know what we can do to evaluate that unless they give us their financial information, which would be interesting.

DR. TEUTSCH: We had some information today when we heard that someone conducted a survey of a thousand people and apparently zero, or close to it, had used the

testing.

DR. FERREIRA-GONZALEZ: As these start showing up in these magazines, and with our esteemed colleague representing us, I would expect that to rise.

DR. AMOS: I just think that Amy's recommendation for looking forward is really critical. At NIST we have looked at the GWAS studies and we have made a decision not to worry about standards for this because we don't think that the technology is going to last that long. We are the government. It takes us a while to do anything. In four or five years the technology is going to be sequencing.

Maybe the kits are not flying off the shelf right now, but when it is possible for $1,000 to get your entire genome sequenced, a lot of people are going to go after that.

MS. ASPINALL: I would actually agree with Mike. I think the relative financial or business performance after a certain hurdle, if these are relevant and being talked about, is not a key issue. We could spend a lot of time saying what is successful and what isn't successful. I think it is a broader policy issue. We will deal with it a little bit in the Futures Panel tomorrow, but it needs to

be something that, from a policy point of view, we think has the potential of being relevant and therefore is high-priority, not literally what is happening today.

DR. LICINIO: I think that, actually, the current economic situation, if anything, is going to pressure the companies to make these products cheaper. 23andMe went from close to $1,000 to $399 a few months ago. The cost of doing this for them decreases, and then, because of the financial pressure, they are probably going to lower the cost, which may increase the outreach. I think that we really have to continue to do this.

DR. TELFAIR: I heard this earlier but I wanted to echo it so it doesn't get lost in the morass. It is going to be very, very critical to have some kind of strong recommendation for monitoring and assessment, whatever else we come up with. We should consider that, particularly around this. If we are going to put forward the policy issues, we also need to consider what is going to be the mechanism to be able to do that. That is going to be very critical in the long term.

DR. FROSST: I will start by widely agreeing with Amy that the technology is going to be changing very

rapidly. I think by the time we really fully understand what we think about this issue we are going to be looking at sequencing rather than a scan.

Then I'm going to agree with Paul and say that I think the volume of tests right now is small. I think the amount of people that are signing up to do 23andMe or Navigenics is small. If you look at it from a public health perspective, does it merit all our time? Probably not.

I think that if we consider the implications of DTC for a gene scan versus the implications of DTC for a whole genome scan, the main issues that we are going to look at are very comparable. It is the broader issue of people buying or getting information for which the validity and utility are unknown and rapidly changing that makes it an important point for us to look at.

DR. TEUTSCH: Barbara and then Marc.

DR. McGRATH: I was just going to say what you said, so I will just second that. I think the price is going down, but still, even at $1,000 or $400 in these economic times, a certain segment of the population is going to do it. As we think about the public health of the

nation, we should be cognizant of who we are talking about. If we look at the larger issue of not specifically the people who are having the DTC tests but some of the principles about it, then I think it makes good sense.

DR. TEUTSCH: Marc and then David.

DR. WILLIAMS: This also relates to the issue of sequencing and cost. I think the point that is going to be different is that the price point is not going to affect consumer uptake. The price point is going to affect the purchasers of services, like the government and the payers. In other words, if payers can get the whole genome at $1,000, they are not going to pay somebody else $4,000 to get one gene.

I think it could completely change the paradigm. Then the push is going to be very different because we are going to have much more information than what was specifically asked for. I think it will be a changing paradigm, but a lot of the same issues relating to validity and utility will still attend.

The small point I wanted to make was just to emphasize something that I heard in the Cogent presentation. Actually, they were all cogent

presentations, but specifically the named Cogent presentation.

Physicians want a repository. Actually, the physicians want a Good Housekeeping Seal of Approval, which the government may not in fact be able to provide. I think nine out of nine said, we want a registry where we can go and see these things. I think that is a strong external endorsement for what this Committee felt very strongly about relating to having a centralized repository for genetic testing. I would definitely want to move that up the prioritization.

DR. TEUTSCH: David and Mara. Then Robinsue. David, go ahead.

DR. DALE: I was just going to comment that I appreciate Jim being willing to speak up about unsubstantiated claims. On the other hand, the technology has a real promise in terms of its medical application. We need to push the research agenda to define where that application is most appropriate.

DR. TEUTSCH: Mara.

MS. ASPINALL: I have two things. One piece is, I very much agree with Phyllis's comment. I think in

general we have to be technology agnostic because we cannot anticipate what technologies are and deal with the information.

I guess, Sylvia, I go back to the comment about the time frame and whether it is one year or three years or four years. My concern on putting a priority on this is when will the regulation likely be promulgated? If it is a result of perceived or actual risk, there is going to be a lot of activity on putting regulations on this. That happens in the next year. Our report that takes three years will not be relevant.

I think the prioritization in terms of timing is our key issue. Coordinating with other bodies that may be taking actions during this period of time is the most important piece to ensure what we do is actually relevant and helps the argument.

DR. TEUTSCH: I think we are talking about something fairly short-term here, too. Robinsue, and then I would like to see if I can pull some of this together.

DR. FROHBOESE: Thanks. I just wanted to add a very brief and technical point. To the extent that this document is going to be reviewing main concerns, on slide

no. 2 one of the concerns listed is privacy protections. I think it is going to be very important to ensure that we are distinguishing between is this an inadequacy with current privacy protections or is it, as I heard the reports coming in, a lack of awareness or perhaps misunderstanding of protections that already exist.

I just want to make that point because you will see in the next session, when we get to research and the HIPAA Privacy Rule, that that is another issue that we are going to be raising.

DR. TEUTSCH: Let me see if I can pull this together a little bit. The initial proposal was that we look at our current recommendations and put together a short report that could be looked at probably at our June meeting and then promulgated.

I also heard some core issues being raised here of things that are beyond what we have done, particularly the discussion of clinical utility, as well as personal or public utility, and how that should inform our discussion. That seems to me to be a large and rather core issue and certainly a lightning rod for our discussion today.

I heard some issues on translational research --

some of which I think were embodied in the clinical utility recommendation -- for privacy, equity, and how should these technologies go on being monitored.

I heard we should probably be technology agnostic at this point because we can never get ahead of that curve.

What I would suggest is that we get a small group together to focus on the short term and give us something to look at in June. They will look at our recommendations and also tell us which of this constellation of other things really rise to the level of things that we should address in what time frame and in what way.

DR. AMOS: I just had one other suggestion. Writing and thinking about this should be fluid. Maybe you could almost put in acceptance gates for the future, to the point where you need a great deal of restriction until the clinical utility and analytical validity is understood. Then maybe you need additional restriction until the standards are in place for the technology utilization.

DR. TEUTSCH: Looking at the overall process of dissemination.

DR. AMOS: Yes.

DR. TEUTSCH: Mara?

MS. ASPINALL: I would agree with your recommendation, with one addition. That is, understand what the other relevant bodies might be doing. I think that would be a key piece to include in the June report so we are not overlapping with what other groups are doing.

DR. TEUTSCH: Does that seem like a reasonable proposal, as amended? Is there anybody who disagrees and wants us to do something different? If not, could I get some volunteers who will work with our dear colleague Sylvia Au?

MS. AU: All the people that I have helped.

[Laughter.]

DR. TEUTSCH: I have Jim Evans, David Dale, Julio Licinio, and Andrea. I think that is great. Others who want to, you can let the staff know.

DR. WILLIAMS: I would think Sarah, if she is not on the list.

DR. TEUTSCH: I think that is a terrific suggestion. Sarah, can we draft you?

DR. BOTHA: Sure. I will do my best.

DR. TEUTSCH: I think these are really critical issues that go beyond our traditional FDA-oriented clinical

thinking about these issues.

Having reached this point and actually gotten to a decision, we have earned a short break. Thank you, Sylvia. Thanks to all the panelists. We will return at quarter past to continue. Thank you.