Q & A
David Ewing Duncan

MS. AU: Thank you, Mr. Duncan. Now we will take questions. Muin.

DR. KHOURY: Thank you so much. This is fascinating; one person's journey into the genome. Just a couple of comments and then I will ask you to tell this Committee what it should do, because this is an advisory committee to the federal government. Some of your closing slides were about people should access this information but there should be guidelines and information, the seal of approval so to speak. And, who will pay.

So there are these mutually exclusive categories. If we get an independent group to evaluate these technologies, then they return [saying] "Don't use them until more studies are done," that could be one recommendation from one group. At the same time, consumers are free to do whatever they want with them.

You went in with your eyes open as to the potential limitations of this technology which is early on. But if you are advocating for guidelines and information, how do you reconcile the need for guidelines with the individual freedom to seek whatever you want. Maybe those two things are not as mutually exclusive as much as they are in my mind.

If somebody tells you, "David, this stuff is nonsense right now," you would have still gone and gotten it, wouldn't you. You were not going in for the medical application. You were going mostly for the curiosity and the recreational aspect and essentially to validate what you already know, that you come from a healthy family. So that cardiovascular signal was a bit disconcerting.

Anyway, I'm throwing too much stuff at you. I would love to hear what you have to say.

MR. DUNCAN: First of all, I really did this as a journalist and a communicator. It is important. When I first did the Wired story back in 2001, we almost didn't do it because it just seemed like a reporting gimmick. But I learned from that and also a story I did for National Geographic a couple years ago where I had several hundred environmental toxin levels inside of me tested. This is a fabulous way to communicate science using a real person as an example.

I said right off that I'm a bit different than most consumers, but I suppose it is all driven by a certain curiosity.

In terms of the contradiction you mentioned, or the potential contradiction, I'm really talking about, in a pragmatic way, it is not that hard to go out and get this information on yourself. You can get it tested in any number of ways.

What you end up getting is what I have, several disks with a lot of lines of data, with results that don't tell you much. But there are already cropping up online a SNPedia, this website which has been mentioned. I have talked to the guys that run that, a couple of young researchers, and one of them I believe is down at Emory. They can run it through what they call a Prometheus Program. I have not been able to do that because I have a Mac and it is only on PC at the moment, but they will run, free of charge. It is fairly crude, certainly, compared to the online companies we are discussing. But there are ways to do this, in other words.

So it may seem like a bit of a contradiction, but I'm being more just a pragmatist here. This data and information is getting more accessible, and there are ways to analyze it independent of anything we are talking about here, any guidelines that might be established perhaps.

But I have thought a lot about who might establish these guidelines, and this is where I'm putting on my new hat at the Center for Life Science Policy at Berkeley and beginning to think in terms of policy. I think one has to balance very carefully the fact that this is a new technology. Silicon Valley in San Francisco, that is where I live. We see these things come frequently. It is important to let these new technologies find their wings and how they are going to work.

It is important that the commercial sites came online here because I think it is tweaking everyone to think about this in a way that they didn't before.

There may be a way to make this voluntary. I think there is some discussion among the companies. It may be that the government at some level needs to step in. I think these are things for you all to decide, in discussion with the companies.

At the end of the day, though, as a consumer, I think one needs to have some sense, and again, that was borne out in one of the surveys yesterday. In fact, I believe it was said that accuracy is more important at this point than even the issue of privacy, which I haven't discussed at all here. Obviously, I'm releasing my results to the world, so it is not as important to me, the privacy issue. I may be completely an idiot for doing that, but we will find out.

But I think the accuracy issue is going to be very important in a Consumer Reports sense. It may be that there are independent groups. There is a lot of discussion even at our center and some other areas [like] academic institutions for creating ratings systems.

I think this will all naturally occur very quickly. This Committee could collect information on that. It could be very useful to have input from all of you and some guidance in figuring out how that process would happen. But I hope that answers the question.

MS. AU: Scott is next. Could I ask the Committee to keep the questions short so we can get back on time?

COL. McLEAN: Two short questions. [That was a] really fantastic presentation. Was it your plan to share your information with your personal physician from the beginning? The follow-on question is, what experts did you consult and how did you find them?

MR. DUNCAN: I started out the whole process, even in 2001, with my personal physician. My personal physician for the original project has retired, but these were very knowledgeable people at UCSF. My current physician is the head of ambulatory medicine there and has more knowledge than most people, although when I brought in some of these results he had to go online and look up some information before he was able to really tell me much. When I start bringing in things like brain scans, he really starts rolling his eyes.

I'm sorry. What was the second question?

COL. McLEAN: You found some consultants, some experts to help guide you when you got specific results. How did you find them and what qualifications did they have to give you feedback on what you had come up with?

MR. DUNCAN: As a journalist reporting on biotechnology for some major media outlets, I have access as a journalist. That is mainly how I was able to access people. Basically, my job is to go out and try to find people like Francis and others who can comment on these things. I take that very seriously. I have so much material it is piled high in my office.

But I also try to get a balance of opinions on this as well, which is really important because there are, obviously, a lot of different opinions and stakeholders and others that need to be brought into the equation. Much of that will be in my book.

MS. AU: We have Paul Miller next.

MR. MILLER: This is very interesting. Thank you. I was struck by what I perceived to be an underlying assumption that I heard in your remarks and actually heard yesterday also. That is about the term "health" and the search for I am in good health and I am seeking good health, as if we know or maybe people have agreed on what is good health that everybody is seeking, and that these technologies are offering insight into.

I was thinking about this question of health against the backdrop of two things raised by genetics that I have learned from Francis. Human variation is a natural part of the human experience. So we have anomalies that are a natural part of human experience. Yet we have these technologies and these companies that are offering the search for genetic anomalies to identify difference with the expectation of exactly what? To eliminate difference? To create better health?

I have achondroplasia. People have deafness. Yet I consider myself in good health, but yet I have a genetic anomaly.

So I'm curious from your perspective how you see that, if you have thought about some of those questions in your journey.

I'm particularly struck by your brother who has OI, osteogenic imperfecta. Had you had a conversation with him or your parents, had they known that 40 years ago, would they have done a gene screen to potentially look for an embryo with OI and then eliminate it? Is your brother in good health or in bad health?

MR. DUNCAN: He is not in fabulous health, but this disease has made him disabled and he is no longer able to work. It would have been nice to have known, I think, probably more for the family than him.

I pursued this trying to figure out what exactly was going on with him through contacts and work with Peter Bayers, who is a prominent geneticist at the University of Washington and an expert on osteogenesis imperfecta. He actually sequenced both my genes involved and also my brother's, COLA1A and COLA2A? 1A? Francis can set us straight on this. They make collagen.

So I pursued this. My brother, interestingly enough, on the conference call when I was up in Seattle with Peter Bayers, said it is all very interesting, what he has, but at the moment there is no real effective treatment for what he has. He is taking some of the drugs that slow down bone loss. But he wants a treatment, and Dr. Bayers immediately said that is what we are after here and that is why we are doing these tests.

I think that is a case where it would have helped our family dynamic to have known this, certainly, because we didn't really know what was going on with him and we were frightened by that. We didn't really even recognize it as being a problem because we come from such a healthy family.

But it is interesting you said the word what is "healthy." Throughout these conversations, including yesterday, as a writer and a person that works with words, I think many of these words we need to back up a minute and even define. I'm not really sure. I know that I feel healthy. I know it when I see it, which has been applied to some other things, too.

But validity, the word "valid," what does that mean? I thought a couple times of raising my hand yesterday in the discussion. People throw [words] around. What is a valid marker. What is clinical validation. That is the word "valid." The other one is "usefulness." I think I understand that one a little bit better, but [I am] a writer and a word person.

We keep talking about Francis here. Sorry to keep putting you on the spot. But, maybe since he has become a wordsmith as well, we will get some more information on that.

But I think it is important that we define these words in a way that everyone can understand them, including the public.

MR. MILLER: I think it is interesting that you keep on defining your family as a healthy family, not withstanding your brother's OI and other issues. So I think health is generally relative. What is a concern is what are these technologies doing to relative assumptions about health and unhealth and how is that related to disability and non-disability.

MR. DUNCAN: There is a philosophical component here, too. I do keep saying that because that has been my mantra my whole life. I'm one of these people that even at 50 years old still considers myself somewhat invincible. I'm beginning to realize that is not the case. I put that out there because we all have different ways of viewing our health. I think it is interesting.

My brother's situation, he was very healthy until a certain point. I still have to stop and pinch myself and remember that he is not now, and that is a real anomaly for my family. So you are catching me up here a little bit on very deep-felt sensibilities about who we are, or who I am.

MS. AU: We have Paul Billings, Joseph, Mike, Jim, and Mara, and we are going to cut it off there.

DR. BILLINGS: David, thank you very much. I have a three-pronged question for you.

MR. DUNCAN: Do I need to get my pencil out, Paul?

DR. BILLINGS: No, no, it is okay. These should be straightforward.

As an experimental consumer as well as an experimental man, what is your perception of the error rate of the laboratories that you were engaged with? Do you think it is low, very low, never occurs? What is your perception?

MR. DUNCAN: There are various levels of potential accuracy or errors here. I think anyone that knows these tests that are run in the CLIA-approved labs tend to be very accurate. I have been run more than once on most of these chips and actually did an analysis, at least on a lumina chip,

on two of my results on the same chip and it came out with almost no error rate. So that end of the spectrum is, I think, very accurate.

I did have that slide. We are going to be doing a more quantitative analysis of the various sites, not only the three here but any others that come within our purview. So I don't have the data on that, but just my swag feeling is that, as I said, I think there is a parameter in most of the results that were fairly consistent. Accurate, that is another one of those terms we may have to define here.

We need to remember, from a consumer point of view anyway, and any other point of view, these are moving targets here as more information comes in. This is something that is really important, I think, to emphasize to consumers and the public. This information is only what we know now and it will continue to change.

Even the sites as I have been monitoring them over the last several months, they changes. Different SNPs come on. My risk factors move around a little bit. New features are added.

Again, I don't think consumers will be overly bothered by this as long as it is explained properly.

DR. BILLINGS: The second part of my question is, for those traits that you have increased risk, how will you monitor them and what evidence are you using for your style of monitoring?

MR. DUNCAN: Well, I don't really have that many. I am monitoring the heart situation. I would love to share with you the fascinating tests that I have had that actually did convince me with a high degree of accuracy that I do need to watch myself and that, funny enough, with a huge algorithm that I was tested on, a couple of the genes that are cited on the sites that we are discussing actually did have an enormous impact on steering this entire algorithm.

I had carotid ultrasounds, a CT scan on my heart, lots of chemistry, and lots of other genetic tests, and a couple of these association study SNPs, especially those on Chromosome 9, did have an enormous impact. We even ran the algorithm as if I was heterozygote instead of homozygote high risk and it did affect the curve quite a bit.

I would be happy to share that with you. That is coming down the pike not too long from now. Actually, the company involved there can offer this test for under $1,000 and it will probably be out within a couple years.

DR. BILLINGS: Then, lastly, are you intending to disclose the results of this test when you apply for life insurance?

MR. DUNCAN: I contacted my insurance company. I think Ryan Phelan said that yesterday, too, or someone, that they had tried to share this with their insurance company. I haven't gotten much of a response. The insurance industry seems to be sitting back and trying to analyze and figure all this out.

I did speak to the major national actuarial group about a month ago and asked them about this. They said at the moment that these association studies don't yet have the predictive power than an actuary really would need to apply them. But I think one can see that there is going to be enormous change.

I'm extremely lucky. I have low risk factors for most of these disorders. If I'm looking around and saying who should pay what, I no longer have the same risk factors as everyone else in this room. In fact, everyone has a different risk factor. On a shared risk sort of system for insurance, how do you determine that if we all know we have different risks? So I think that is a challenge that will be coming up for how we go forward with insuring ourselves.

MS. AU: We still have Joseph, Mike, Jim, and Mara. Can we keep them to single questions, please?

MR. DUNCAN: I will give a quick answer, too. Sorry.

DR. TELFAIR: Just as you get to me. Okay.

[Laughter.]

DR. TELFAIR: Thank you for the presentation. I appreciate that. My question actually is just interrelated. I want to switch the questioning a bit.

In terms of where we sit as a Committee, our real concern is what it is that we can recommend for the population as a whole, a public health question. So I'm asking you a public health question. In terms of use of the information, what is your expected outcome for use of what it is that you are doing in terms of beyond this, and whether you have one or not.

The other part of the question is, what would you recommend related to prevention? I noticed that the argument yesterday for a number of the DTC panel was that there is a lot of added value to knowing in terms of motivating behavior. We know that that is really not the case in so many cases, and you yourself just confirmed it wasn't.

So in terms of use for the information and in terms of what recommendations would you make to the population in terms of prevention and that sort of deal.

MR. DUNCAN: Again, I think we are in an interim phase here and things are in great flux. In the future what I believe will happen here is that we will have batteries of tests. This is already beginning with some neonatal tests at the very beginning of life for some people. We will continue to have expanded batteries of tests earlier and earlier in life that will give us some indication.

I sometimes pull out my iPhone, which I think I have here somewhere, and I believe sometime in the future, maybe the next generation, we will have something called, maybe, an iHealth that will actually tell us and give us probabilities and possibly even measure things like what is in the environment around us and other measurements like that that will be factored in and do all the work for us and tell us what is coming up.

I don't know about living in that world. It would be interesting. Some people will embrace that. Some people will be perhaps frightened by it.

But I think when you are talking about predicting the future, which is essentially what we are doing here, we are a long way from really doing that for most people. The rarer the disorder, obviously, as you all know, the more predictive power there is.

But in terms of guidelines for preventive care, I mentioned a few of my thoughts and ideas. I think we need to accelerate dramatically this process to validate, whatever that word means, but to clinically validate, to spend some of the resources we have been spending on the pure science now and shift over rapidly to applying this information to individuals to find out what is really going on.

If one comes out with a homozygote high risk for prostate cancer, which was mentioned yesterday, I think what a consumer wants to know, and to make it really effective, would be to do a thousand of those, or whatever the number needs to be in a clinical test, and get a biopsy. You actually come up with some results that are meaningful.

So I'm hoping that the federal government and others who have the resources to apply to this will focus more on the individual now and how this science applies to the individual. Does that answer your question? Sort of?

DR. TELFAIR: It is okay. I can't ask another one.

[Laughter.]

MS. AU: You can beat up Mike and get his question.

[Laughter.]

DR. AMOS: You can have my question. I'm going to hold it. I'm going to talk about standards and standardization a little bit later. But you have my question.

DR. TELFAIR: I appreciate that, but I think I'm going to save it for the DTC panel.

MS. AU: So then we will move to Jim.

DR. EVANS: It was a really fascinating presentation. You are doing something right because you look far younger than 50.

I'm interested in this idea of personal empowerment because it came up yesterday as one of the justifications for doing this and doing it now. My feeling, and I want to get your take on it, is that personal empowerment only follows from the prior demonstration that this is useful information. There is a large percentage of people in this country who find their horoscope personally empowering, but I don't think. that we should really be in the business of encouraging personal empowerment based on illusory ideas of what is really useful.

So, does it make sense to you to separate out this idea? Right now, getting your genotype at 500,000 sites, do you think that is personally empowering or do you think that needs to wait until we actually have some evidence that you can do something with it before it is truly personally empowering?

MR. DUNCAN: I think my story is that it has not been particularly personally empowering given what you said. In fact, and this was one of the possible outcomes of this experiment, most of it has not been particularly useful for an individual. In fact, most of it was not designed to be particularly useful for an individual, which is a primary point here.

I'm talking more about the future and I think what people would like this to be. Any information that a patient or a consumer who is interested in their health can have and understand and use on their own I think is important. There is, of course, an extremely important role for care givers, physicians, and others.

In this age when consumers have so much access to information, there are those, as we heard yesterday, that seek it out, that are almost desperate to have it, I think it is incumbent on this Committee and others in positions of responsibility to figure out a way to create an atmosphere where people feel that these are accurate without squelching or throwing the baby out with the bath water.

As I mentioned earlier, there is an ongoing experiment here on how to apply this information, which is very useful and actually quite exciting. These three or four sites here that I mentioned all have different methods. If you throw in the Coriell Institute, you have a nonprofit model there. I know of several others that are out there about to start.

It is one of those delicate moments where in this transitional phase I think responsible parties need to make sure that there are some accuracy and guidelines as much as possible and an educational process to explain to people this is a transition period, alongside allowing these experiments to go forward in a responsible way.

MS. AU: The honor of the last question goes to Mara.

MS. ASPINALL: Thank you, but I'm going to keep it to a simple question. The role of genetic counseling. You spoke about that on a couple of sites and throughout the initial part of your odyssey. What was the role of counseling? How did that make you feel more and less comfortable, and how do you see that playing out in the future?

MR. DUNCAN: I think at this phase people are not used to getting results online. Some are. Again, I'm in the Silicon Valley culture. People are much more used to receiving information. It is always interesting to come back to Washington, where I lived for a long time and worked, and the East Coast. We are much more involved with getting our information perhaps online back in the San Francisco area and on the West Coast.

But I liked having the option, first of all, as a journalist, of being able to talk to a bunch of people and understand these things. But I did go through the process as a consumer would with those sites that offer genetic counseling. Of course that was reassuring.

I was getting these services pro bono. I don't know if I would be willing to pay thousands of dollars for that. I might have to think about the price points on that. That might affect my answer.

But I think having some access to somebody that you can talk to if you need to [is important], and that is why I mentioned in my thoughts and ideas, having given this some careful thought, that maybe one way to deal with this is to have physicians that review these results possibly hired by the companies or maybe independent, I'm not sure which. But, somebody watching to make sure that there isn't something a consumer misses.

I think that is important. There may be some result there that they don't really fully understand that is important medically. I think there needs to be some system for that.

It would be great if all the sites would have genetic counselors you could call and talk to. I don't know if that fits into some of the business plans. Perhaps it should.

MS. AU: I would like to thank Mr. Duncan. In the spirit of trying to catch up with some of our time, can we try to make it back here by 10? We will take a break right now.

MR. DUNCAN: Thank you very much.