

2006 National Environmental Public Health Conference
Advancing Environmental Public Health Science Practice in New Frontiers
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8:30am Plenary Session 3

Dr. Jackson: And if you think it's early for you, on the West Coast it's really early. Good morning, I'm Dick Jackson. I'm among other things the former director of the National Center for Environmental Health, and it's fun to be back here with the family. I have to tell you that I love public health and I love environmental health. And I love CDC. It's really wonderful to be back. It's painful to see the troubles it's going through, and I really love the Center for Environmental Health, so it's a treat to be here with family.

When I left CDC I went out to California and became the state health officer. And it was quite interesting. I went to the first staff meeting. There were about 20 people in the executive staff meeting, and I realized there were only two people with MPHs. And they introduced me and they said, "Oh, this is Dick Jackson, he's from the CDC." So in the next staff meeting they went around the table, and they introduced people and they're all administrators and managers, and they had come from other agencies. So I began to learn their acronyms. And in the third meeting, I realized that many of them had worked in one of the biggest agencies in state government. And so they thought whenever I said I was from CDC that I was from the California Department of Corrections.

This is relevant to the whole experience. It was very difficult to get things administratively completed because the managers and the administrators did not have the mission of public health imbedded in their souls. And one of the enormous strengths of CDC has been the public health advisor series, because the public health advisors often came out of very practical public health experiences: the STD program, the TB program, many of these other field programs. These are young men and women who are then cultivated to become managers within the CDC structure. And I have to tell you as a CDC leader it was so delightful to have someone who really knew how to manage and administer in that system.

And I was lucky to work with terrific people, including one of the organizers of this meeting, Jerry Hershovitz. But one of my other heroes when I was at CDC was a man who dealt with an unbelievable set of challenges. I remember one day during a rainstorm, and we were called over to our decrepit laboratories and water was pouring down the walls on a 220 junction box and on equipment that cost half a million dollars, and this gentlemen took care of it. Another day an employee—an estranged husband of an

employee—showed up with a gun. You can image what that was like. And this gentlemen took care of it—over and over again, with quiet dignity and leadership and honesty. When Bob Delaney was administrator and deputy of the National Center for Environmental Health, he was right there. And one of the reasons the Center for Environmental Health went from 60 million dollars to half a billion dollars was because of the stewardship of men like Bob Delaney, and particularly Bob. Bob retired about a month ago, and it is my honor to present to Bob a plaque to thank him for his hard work. So come on up here, we're going to embarrass you, Bob Delaney.

Let me read this, and then maybe Bob doesn't like to say words, but we'll ask him to say at least a few words. It says, "To Robert J. Delaney for sustained excellence, exceptional commitment, and outstanding contributions to the field of environmental public health. Presented at the 2006 National Environmental Public Health Conference December 5, 2006." Bob.

Bob: What a surprise. What a shock. Thank you very much. When I started, Jerry Hershovitz and I worked together in environmental health before there was a National Center for Environmental Health; I think it was 1978. The environmental health services division at CDC, Dr. Hoff was division director. And it's been—I basically grew up in environmental health and supporting the great scientific and technical work of the professionals. And my voice is shaking because I'm just shocked at this. I just want to thank everybody, and Dick and everybody else. This is just a wonderful award for me. Thank you.

Dr. Jackson: In case you haven't noticed, he's also a humble man, which is a good thing in this world. You are very lucky we've got a wonderful panel this morning. And as we go forward I will introduce them. We're going to keep our presentations to about 10–12 minutes so that there is plenty of time for dialogue as we go forward. Let me look at the first slide. I want to start off by commending Dr. Frumkin for what was in my opinion a courageous declaration in an effort to speak truth to power about the importance of global warming in the 21st century. Global heating, I think, is probably a more accurate description.

I was gratified to hear Dr. Gerberding say that she will include a discussion of these issues in every presentation that she goes forward with. I think you may look back years from now and say that was an important turning point in the history of public health in this country. I'm going to talk to you a little bit about the next election for just a minute, because I think the next election will of course be about the economy. The dollar is dropping pretty rapidly, and middle class people and working class people are having a very tough time. It's going to be about the Middle East, in particular the war there. I don't know if it will be Iraq or Syria or somewhere else. But that will be the number two issue. And the number three issue will be global heating. And let me emphasize a couple of more issues just to capture it. By the way, there's a truck I'm thinking of buying in the spirit of seeking to have a new Peterbilt, so to speak. Look at this shift in CO₂ production just over the last 500 or 600 years. And what's striking to me is in my lifetime

it's gone from about 2 billion tons to about eight. And in my son's lifetime it's doubled. The speed at which we are adding carbon dioxide to the atmosphere is astonishing.

And of course the atmosphere can only soak up so much. So the levels in the atmosphere are going up dramatically as well—and in my brother Jim's lifetime up about 50 parts per million. It's also important to realize it's not just what we're adding to the atmosphere, it's also what we're taking away. And we've lost huge amounts of tree cover on the planet. It's one of the reasons we're so concerned about urban planning, and the environmental loading, and the attention to photosynthesis on the planet. But one-sixth of all of the increase in CO₂ levels is related to deforestation.

I'm going to reflect a bit on being from California. The implications for our state are staggering. The state is immensely dependent on the snowpack. Mother Nature holds the year's water up in the mountains that we use until the next set of rains. It's a wonderful and very inexpensive source of water, and the projected snowpack by mid- and late in the century will be down to only about a foot of snowpack in April, at the beginning of the summer. It means we're going to have to rebuild for tens of hundreds of billions of dollars the entire California water project. Think of the economic implications of that. We've analyzed a lot of it. Where is California's contribution—the loading of our atmosphere and transportation is a very big source of this. So California's moved forward in becoming much more green and has essentially developed a number of programs to really ratchet down the environmental loading of carbon dioxide.

People will tell you: well, the economy will suffer if we put controls in place. California has slightly less electricity per capita, but we had essentially flat-lined electricity use in the face of a robust economy for the last 30 years by energy efficiency in plants. Manufacturers, buildings, appliances, and all the rest, the rest of the country has gone up and up and up. We've despaired of national leadership in some ways and have gone ahead signing agreements. So the governor of the state is signing an agreement with the head of state from another country on what they would do jointly to control global warming. And we've put in place, with the total endorsement of the legislature and the governor, essentially signing onto the (unintelligible) protocols. Because it's too urgent to wait for national leadership.

We can deal with this. The planet receives enough energy from the sun—and our state does—to deal with all of our energy needs many, many times over. Here is one small example. These are solar rays on buildings. But here are Sergey Brin and Larry Page, the guys that started Google, now investing in nanotechnology and photo sheets of photo hole tags. This will completely change the California economy. They're now producing this stuff, and the American economy—and some of the things these kinds of changes add for the economy. We can actually create safe and healthy places without using huge amounts of fossil fuels. So maybe there are things we ought to be doing at a personal level. I love this little program from Morris County, New Jersey, "Be cool, walk to school." And we have three New Jersey-ites in the presenters here. I had to touch on New Jersey. And Tom Sinks and Howard Frumkin who drive Prius's.

They are very good citizens, but every mile they put out about four to 500 grams of carbon dioxide. But if they walk or bike they put out one gram of carbon dioxide.

So think about a magic 10-year-old child who decides he's a good citizen. He's going to walk to school every single day. And he does it back and forth, one mile each way, and at the end of the year, he's burned 18,000 calories, and he's lost five pounds of body fat. By the way, the average 10-year-old gained 10 pounds in the last 25 years. So it will take about 2 years to get back down to a healthy weight. That's really good, and if all kids in California did that, they'd lose 32 million pounds. We'd save a lot of money for the State of California. So this is the truck I'm thinking of buying. It holds about 2,800 gallons. And so if all the kids in the state decided that they were going to get in the car and ride with mom each way to school one mile, how much gasoline would you use? Well, if you drive a mile you use about six ounces of gasoline. And so at the end of the year you've used an entire tank of gas. And all 6 million kids use an entire tank of gas. It's 96 million gallons of gasoline, which comes out to how many truck tank loads? — 35,000. So Howard Frumkin's point about what's good for our bodies, what's good for our air, what's good for our environment, what's good for our neighborhoods, what's good for our sense of community, and what's good for our planet is all coherent. It all comes together, and they don't need to be set up as adversaries. So again Howie, I want to thank you for your leadership here. I will skip this slide and I will go forward with the presentation at this point.

I think the bottom line of what I want to put forward here is you have a whole layer of practitioners. You have—in the sense of Sarah Kotchian, doctor of American history, American Studies, who was the premiere environmental health director, I think, of many of them that I knew. She was the environmental health director in Albuquerque, lasted five political administrations and built a wonderful morale and research base in science when she was there. She'll talk about that experience. One of the finest environmental public health leaders I've ever known is Tom Burke. It's not just because he's a St. Peters College in Jersey City graduate. But he was also deputy head of the New Jersey EPA and the New Jersey Department of Health. So he's bridged both of these worlds, and he's been a mentor for many environmental public health leaders as a professor at Johns Hopkins. Mindy Fullilove is from Orange, New Jersey, and a Bryn Mawr graduate and a grandmother and a psychiatrist and someone who's thought deeply about the meaning of community, particularly the meaning of community for people's mental health and for people who are disenfranchised and disempowered. And she'll be talking about what are some of these larger issues. And at the end Xavier Bonnefoy, who was the head of environmental health—he is basically Howard Frumkin's counterpart for Europe—for the World Health Organization, and a marathon runner. And we will all go through our presentations very, very quickly. And I want to thank all of you for listening, and welcome.

Dr. Kotchian: Good morning, everyone. I also want to acknowledge a couple of people here today. And the first ones are Dr. Gerberding and Dr. Frumkin for supporting this conference, and then I want to thank Jerry Herschovitz and Steve Margolis for their tireless work over more than a year to make all of this happen for all of us—and this didn't have to happen. And with the support from CDC leadership we now have 1,600 people from around the country here with a wonderful array of sessions. I went to many of them yesterday, as I know you did. And the speakers are excellent. The science and the practice are evident, and we're fortunate to be here. So thank you for your good work.

Since we're talking about what we love and Dick said he loved the CDC, I have to confess that I love them too. But I love the local level of public health, environmental health practice. That is where in my mind the closest action happens to the community. And I would bet that most people in this audience at some point in their career have worked with people in local communities. And even if you are at the federal level now, you have the experience. If you are in Indian Health Service you've worked with tribes, you've lived on the reservation. If you are at the state health department or a state environment department or one of the other many places environmental health is practiced, you've had some local experience. And my hat is off especially to those people who day in and day out work at the local level with communities, with all of the difficulties and challenges, frustrations and joys and satisfactions that comes with that. And I've seen many of my colleagues out in the audience who do that every day. And you are a blessing to all of us. You are a blessing to your communities. And I'm glad you are here for a couple of days, that we can steal you away to become refreshed and restored and reinvigorated and encouraged by what you hear and to know that you are continuing to do the right thing out there.

Dick is a difficult taskmaster. So he told us all yesterday that we had 10 minutes and seven slides. I'm cheating; I have 15, so I'm going to get going here pretty soon. But my job today is to set the context for what has changed in our world that has changed the communities we work in and what that demands of us. And because of time limits I'm going to assume some things. I'm going to assume that you are pursuing excellence in every way that you know how for environmental health practice. Which means that you are seeking to learn about and use the 10 essential services of environmental health. That you understand what the core competencies are and that they're on the APHA Web site. And you are training your staff to have those competencies. That you are hiring people trained in science. That you are encouraging your staff to attend the Environmental Public Health Leadership Institute. And I think the deadline is this Friday for applications for that. But if not, we're fortunate that CDC is planning to fund that—we hope—for at least another four years. We have graduates from that in the audience too. That you are trying to encourage innovative workforce practices and on the NEHO Web site you'll find some of the winners of people who are working to train and retain an excellent workforce. On the NACHA Web site you'll find models and promising environmental health practices. So I'm going to assume that you are doing those things, and we'll go on to what I really think are some of the bigger challenges in environmental health and what the

priorities are for us.

So again, what is the state of the new world and how do we have to change our practice and maybe, just as importantly, how do we need to change ourselves? What attributes do we need to cultivate in ourselves and in the people we hire? So who is the new community? Well, the demographics in the United States are interesting. And I didn't have room for all of the percentages but I gave you just these key percentages over the next 50 years. And I'd like you to be thinking as you look at these about what's true in your own experience. What you think these changes might require of you. What you are already doing, and what you might be able to improve in what you are doing? And then we'd like to have a dialogue that follows. So if you think of things that we haven't included, please remember that we want to have a lively exchange at the end. And I think to sum up, the bottom line is we need to embrace change and there are also many paradoxes that we're going to have to be comfortable in embracing. And I'll go through a few of those that make it difficult.

The new urban forms—you've heard a lot about this. But think about the pressures this might put on your work at the local level, state, tribal, federal level. So this fall we'll have increased mixed uses, and that that's a good thing, and that allows us to have more transportation and pedestrian options. But it also creates conflict. And we are the people that are going to have to mediate that conflict with our communities and with our elected officials and our businesses. The rural community is changing drastically. Those of you who work in Iowa and many other rural states understand the pressures that are brought to bear on traditional uses. Property values are going up, the small farmers are selling out, and large agriculture is coming in. And the new rural neighbors are in conflict many times with the old rural neighbors. And again, many times environmental health is right in the middle of those issues — the new global connectedness.

And if you haven't read *The World Is Flat*, you need to read it. It's a couple of years old now, but it's fun to read. Lots of stories in it. And it's a quick skim if you don't have time to read the whole thing. Our connectedness makes us more vulnerable even though it's a benefit to us. And it allows us to see the impact we have upon each other, and it reminds us that all public health is both local and global at the same time. In the last few years particularly, we've begun to understand what massive disruption of our systems can do to communities. And it's another reason why building community is really the only long-term strategy for community health. It's not what we do ourselves as our agency, but it's the capacity we build within our communities to take care of themselves, to identify their issues, and to know what to do about those issues that long-term is going to guarantee health. New technologies—and I have my cell phone—which is pretty big by tomorrow's standards. It's small by my standards. I was telling Tom and Dick yesterday that if we have an interesting dinner table discussion and we have a question that we can't answer, my 17-year-old without me knowing it is texting under the table or doing whatever he does to get on the World Wide Web, and then he shows me the answer. His children, my daughter's children, they're going to have something

else that we haven't even conceived of yet. So the world is connected, and I encourage us to be engaged in it. Actively seeking creatively, enjoying that new technological world, because the generation that we're currently in and coming behind us is getting ahead of us.

I don't know if you are familiar with You Tube. It's a Web site that's free for people to post their home movies on. And there are thousands of movies on it. And we ought to be taking advantage of things like that to get our message out. I don't know how many of you have seen the video on why don't we do it in our sleeve. It's how to properly sneeze into your sleeve. And it's trying to make it socially acceptable to sneeze into your sleeve or the fibers will capture and the germs will desiccate, and telling you not to use a Kleenex and not to touch things with your hands. So anyway, we need to be taking the power of that to sell our own message.

Another very interesting book, very hard to get through, but very challenging, is *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* by Ray Kurzweil. He's one of the great inventors in American history. He's received that award. He was born in 1948, and he's written a number of books. This one talks about artificial intelligence. And the Web site I've given you there has a blog on it where he responds daily to people's ideas about the future. And it's just a really interesting place to check in and see what some of the challenges are that are facing us.

So these are some of the trends, and obviously these are the conflicts that they generate, including competition for always-scarce dollars. And our public's expectation that we will have information that is instantly accessible. And in fact they won't rely on us for the information, and they'll get it themselves immediately in many cases.

So we are calling for change. We're living in a different world. So what are the three critical abilities I believe—beyond the ones that I mentioned—about science and striving for excellence? This is what I think they are, and I think the number one is community-based empowerment and capacity building. There are lots of tools out there. We need to be familiar with them. We need to understand our health data, our social data. All of the social determinant data in our own communities. And mobilizing strategies—this means we're hiring a different kind of person than we hired before. Before, we looked for the bachelor of science or the master in science and the master in public health. But now we also have to be looking for people who are not only comfortable but enjoy being out in the community, because the world has changed. There are no longer as many places for people who aren't comfortable with other people, and especially with different people.

The world is full of difference at this point, and we may have thought we're doing community-involvement things—we always have. All of us have had advisory committees and outreach and public education. But

this is different, and we need to understand the theory of the political skills and telling our story. Here are just a couple of ways to think about telling the story. Environmental health really is the story of the heart. It's stories of where people are touched by things in their environment that make a difference in their lives, often a negative difference in their lives. And we're in the business of making a positive difference so that bad things don't happen to them. And we need to tell their story in a way that the people with the resources and the support understand it in their heart. And I don't know how many of you—like I have—have been up in front of elected officials with lots and lots of data and facts and they are not moved. And we don't succeed, and we only succeed when they understand the story of what affects their people's lives.

So we need to be better at telling the story. The power of the picture, for instance GIS technology, and that's been around for a while now. We use that quite a bit in Albuquerque. One of the ways we used it was to do a disparities study. And we layered information, that's all it was, layering information of single female heads of household, numbers of children in poverty, where the hazardous waste, hazardous emissions were in the town. We layered voting records—how often people voted. Obviously, we layered all the ethnicity and all the other demographic data. And we found some interesting clusters of things which would be valuable to elected officials. And it would be things like, where would you concentrate your resources if you knew where the greatest number of children in poverty were and where the highest number of asthma cases were? And in fact we did go on to use it to work with a few schools in high-asthma, low-income places where we knew kids were not getting access to proper treatment. One of the most interesting things from that study was that people who voted tended not to have more hazardous facilities in their neighborhood. Now we didn't try to prove cause and effect, but that was an interesting finding. And that's an encouraging finding for communities in saying you need to be active and involved in your communities.

And then the third is understanding system interactions, economic systems. We haven't been very good in the past in understanding how systems work and particularly our economic incentives. Understanding that at a very deep level so we can be partners with economic community in selling them things that will be good for them and that are good for health and the environment. And we're not nearly as facile in those figures and facts as we need to be.

And then finally, five critical attributes, and these aren't the normal ones you might see on a list for environmental health, and that's why they're here. The first one is curiosity. An attitude of curiosity keeps us from having our judgment get in the way of being open to new ideas and new perspectives, and the differences in our community that can actually bring information to us and strengthen us. Curiosity will lead us to the learning we need to do, whether it's about technology or the latest science or the research. So I define this very broadly. But cultivating an attitude of curiosity in yourself and in the staff that you hire and that you already have.

Secondly, humility. This is one of the paradoxes I talked about. We have studied for years to become expert only to be asked by our communities to set that on the side so that we are one resource, but that they consider themselves the experts. And it's a balance. And it's not that we're not going to use our science. But being humble allows us to avoid the arrogance that inevitably comes along with our position and our power, and the place we work, and creates a barrier between us and them. But it's something that has to be cultivated many times because we're not even aware of it at some times. We'll need to listen to tell what the community is telling us. To hear it, where they see the disparities, what their moral issues are, what William McDonald calls the "Metrics of the Heart." What do they care about? What do they want to see change? Those are the same things that your elected officials are going to want to know about. Commitment to excellence I mentioned earlier; we have to have that to strive for the best and to find out what we need to do to continually improve. And finally, personal energy—there isn't a substitute for that. And if we don't have it, we need to find the source of our passion that gives us that. Because we need to inspire the people we work with, with our own energy and enthusiasm. And without that, there is something missing.

So I think we have a choice. I think we have a calling. Those people in this room have responded to that call. We have a choice on how we conceive. And I would say that we continue to cultivate our curiosity, our humility, and to work with joy because it is a privilege and it is a blessing to serve. To listen, to understand that change is really the constant we can expect and embrace technology and seek to become wireless and to use all those things at our command. Build capacity in our community—it's really the only long-term key to their health. And finally, have heart about what you do. The root word of *courageous* is *heart*, and having heart for the people we work with in the community, the people we work with side-by-side, our agency, and our community partners. We will continue to be able to handle the changes that have come to our world. I look forward to our discussion, thank you.

Dr. Tom Burke: It's great to be here. Thanks, and I'm not going to spend a lot of time with that except to say you owe me another dinner—the Eagles held on to win last night. And thanks, Dick, for inviting me to be part of this. Because I want you all to remember this meeting, all right. This is a meeting where if we listen, and we take it to heart and we're able to operationalize some of the things that we heard yesterday: there is fundamental change in environmental health. But there are lots of challenges there. And so now it's interesting on the academic side to come in and kind of give the academic perspective. And academic means I'm always the practitioner who will give the real word. So I'm going to mix a little bit of both. A little bit of reality to take us down to the challenges that yesterday leaves us with, particularly from an academic perspective. So, first slide.

As you heard yesterday, there has never been a more challenging time. The plate is full already in environmental public health. And working on the local level, on the state level, on the national level with

decreasing funding, a changing work force, there are so many issues challenging environmental health professionals. When we think about global environmental issues, it's almost overwhelming. How do we do this? How do we get prepared to deal with everything from disparities to global climate change, to that very difficult social policy challenge that we have here, to really be effective. When in fact, we're kind of in a straitjacket because of our past regulatory and public health initiatives. It's incredibly challenging. But there is pretty good news here, though. Despite decreasing budgets and lots of argument about the relevance of environmental health, they need us. In reality, policy makers desperately need people who can make a complicated thing workable. But by the way, to be engaged in this, we have to understand the policy process too.

So we've got to talk about education. True or false here: everything I need to know to do my job I learned in school, all right? Just hearing the bios of people speaking all through the conference I'm thinking, wow, Dr. Frumkin's a clinical guy. I remember him at Penn—we were studying some pretty sophisticated epidemiology.

That's not how you run NCEH. And just hearing the bios of folks, let's face it; we come from many, many disciplines. And I don't think anybody would answer "true" here. Because I know when I got my real first public health job I couldn't sleep because I was overwhelmed by the responsibilities. And I think this is really tough to translate into good academic training. And the work force is in trouble—it's kind of nice to be a baby boomer. But let's face it, there are a lot of geezers in the work force now, and we remember Earth Day and my students weren't born then. And I can tell stories about Love Canal and they think, was that like a hippy love-in?

So we've got new challenges, and we're having a hard time keeping up with the traditional responsibilities. When I speak to my colleagues in New Jersey and realize how dramatically the work force has shrunk, when we do our research in environmental practice and realize the challenges on the local and community level, these are tough. Plus, I see all the time, every day, a prospective student will come and see me, and they're interested in the built environment. They're interested in multi-disciplinary studies. And they look at the course list and they say, "Dr. Burke, what course do I take? — I'm not sure."

Frankly, I'm not sure if we're set up for this. And it all goes back—and we've heard this from the IOM in 1998—about the fragmentation of environmental health in this country. And frankly we've done some work, and many of you are familiar with the environmental web—just how balkanized our laws, our agencies are. You heard words yesterday about stovepipes and things like that. They're all small like drinking straws in some areas, because we've become so narrow.

And yet we have a challenge to go beyond this and to integrate this. But the consequences of where we are

now, the unintended consequences of that stove-piping of the web are that we haven't really built environmental health sustainability into our major policy choices, energy, or transportation, or water resources, the kinds of global challenges that Dr. Frumkin laid out there so well for us yesterday. We're not there yet. We're not structured for that. Others here are leading that effort with CDC support to look at our infrastructure. But the top environmental health problems in Maryland for the local communities, for the counties are the same type of global issues that we saw the challenges presented yesterday: population growth, sprawl, the degradation of an important watershed, the Chesapeake Bay watershed. And drinking water and water quality, basic fundamental public health related to the big picture. So how do we bring these together?

We also found out that we have some real training issues, that our ability to address contemporary environmental public health challenges is limited because the training opportunities are so limited. There has been no support for this since 1980, frankly. Lots of us here were lucky enough to get public health fellowships to get trained. Students today are taking loans out to get trained. We have to change training availability, the adequacy of the training, training for leadership. The feasibility of getting people trained, to become part of our course work.

And frankly—and I've been harping on the center for a long time—where is the pipeline? How are we supporting the pipeline? In other branches of government, we make sure there are emerging new leaders, and we have to make the financial investment in that it's cheap stuff to do. But there are signs of change. Frankly, there is a recognition of global environmental issues like we've never seen before. This meeting, write this meeting down. This is going to be an important meeting in the change and the recognition of the problem. We have even world leaders saying we're addicted to oil. Things that I never thought I would hear from the political leadership in this country and globally, they recognize some of the fundamental issues of global change. Katrina, unfortunately, was a very difficult lesson learned about the built environment. And the environment-ecology linkage is alive and well. It's not yet there in the agencies and it was great to hear the EPA representative and Dr. Frumkin talk from the CDC perspective. But we're not there, so it's time. I think we might be thinking about revisiting environmental policies, which we're going to have to do. Or are we also thinking about investing in the workforce?

And how do we do this? Well, frankly, when I hear things about transportation and energy and everything else, I don't know that public health training can do it all. We have a very important part to play in this, in this partnership, but it's got to be a partnership. When folks come to me about training, really, we're talking public policy. We're talking urban planning, architecture, ecology, behavioral sciences, engineering; professionals in public health, professionals in environmental public health, from all disciplines will have to be part of the solutions. And we have to support that educational process.

So how do we get there? Well, I'm sitting there thinking yesterday and the first thing is, I've got to design some new courses. I don't think we're training people to do this stuff. But how do you define the core competencies for the changing environmental public health professional? The old problems are still there, but we really have to define those competences—we need your help. We need the help of the center, we need investment in this. We have to think about it from individual courses, from continuing education, through concentration, certificates, and doctoral programs. We have to think about training the new leadership as well. We have to make fellowships available once again, we have to invest in the future pipeline.

This is expensive stuff for students. And I'm not talking about research for faculty members — I'm talking about students who can't afford to come to school, can't take time away from their practice jobs to pay tuition for the necessary education for enhancing their professionalism. We have to involve the practitioners in the educational process. That wall between academia and the practice community has to come down. And it's been there, and we've set up barriers. You can't get promoted, you can't get appointed if you are a practitioner. Those things are changing, but we've got to break that down. And we have to develop a mentoring system both within the walls of academia and outside the walls. That's why I think the leadership and the continuity with NCEH and these meetings have been so important.

So what are the competencies? This is tough, but I figure I'll take a stab at it. I'll teach some of these things, so it's a little self-serving, but how do we get there? This is so multidisciplinary, what we heard yesterday and what we've been hearing. There is a new need for transdisciplinary problem-solving. Knowing where to get the expertise you can't get at all. We can't all have six PhDs and a real job. There are some professional students in academics who might be able to get away with that, but the public health sciences are at the core. We can't forget about those. But we have to have better offerings in ecology and human health in the connection. We need leadership training, communication, management—including crisis management risk and threat assessment, how we set priorities in a very difficult set of choices. Surveillance—you know, those indicators are really important, tracking is a first step, but we're not there yet. How do we track our progress toward the global goals that we heard outlined yesterday? —evaluation and, frankly, the last one, political survival. Most public health leaders have a limited lifetime, as you know. I don't mean lifetime in their life; I mean lifetime in their careers. We get old.

So to make this happen we also have to support the research base. Let's face it: academia is about research. Involving students in research and applied research will get us there. So we need to create those opportunities that need to be inclusive, and we need to translate that research into reality. It was kind of refreshing yesterday just how well-grounded the presentation was and how it related to the practice of public health. Because there are too many meetings about the future that really are the future. That's a real reach for public health practitioners. And we need to be able to evaluate our progress and present it. One of

the problems with recognition of the issues that we're talking about here in this meeting is that we haven't done the evaluations and presented the data to policymakers to make it happen. So now is the time. If we're redefining our current approaches to environmental public health, we have to redefine our approaches to environmental education. We have to develop the competencies for the future professionals, but not forget about the past. Those old water issues are still there, those basics are still there. But we have to build the multidisciplinary scientific foundations for redefining education in environmental public health. And most of all, shame on us: we cut off the pipeline. We cut off the financial support for future leaders, and we've got to reestablish that pipeline. So I'll stop there.

Dr. Fullilove: I feel like saying, "There are a lot of seats in the front." Dick said that I'm a psychiatrist. There have been quite a number of people who have already talked about the heart, so I feel in good company today. And what I'd like to talk about is the process of living in the environment—that the environment is not a static thing, we are actors in the environment, and we are actors in relationship to how the environment is organized. So if there are toxic chemicals in the environment, it's because we put them there.

So this is sort of the overarching frame—that we are actors in the environment, and what I'd like to really put forward is the idea that the built environment of human habitat is not optional. That the way the environment is put together is essential to health and to mental health. And this is rarely integrated into environmental health sciences at the scale and with the historic sensibility that's really required. But if we do this, we will open up a huge new domain of intervention that will really change mental health and the prospects for the future. My work has largely been in African-American communities. So I'd like to start with just putting out this kind of very basic timeline of the fight to really achieve equality in the United States. African-Americans arrived here and were sold into slavery, endured that and fought against it constantly. An enormous movement for abolition of slavery arose in the United States. But fast forwarding, we also see that despite the African-Americans and many, many allies in other groups in the United States' incessant efforts to achieve equality.

Jerry, we convene in our groups at 10:30? Next workgroups. Thank you very much.

End of Plenary Three