

Okay, good afternoon. It's a pleasure to be here. I guess by, I don't know, things happen in life. I've become an academic somehow, although I started out as a pediatrician a long time ago. And it's wonderful to be surrounded by lots of people who are not academics. It's the closest I come to this is—when I try to explain to my mother what it is that I do, she says weren't you a pediatrician? How did you end up just showing us that living in places that don't have good things is bad for health? But that's life I guess. So I'll tell you a little bit about—I want to share some thoughts with you on work that we've been involved in on the general issue on the impact of place, and neighborhoods, and communities on health. So I'd like to start out just with this figure. This is actually taken from the New York Times, which has very good graphics; much better than many scientific papers actually, showing out of a series of articles that Times published several years ago on diabetes in New York City. And I show you this figure because it shows, first of all, increasing rates of diabetes as we all know. But also incredibly striking differences, geographic differences, across New York city neighborhoods. And the percent of people with diabetes. And we're very used to seeing area differences in things like violence or infectious diseases. For example, aids. But this shows that even a chronic disease like diabetes, which is chronic disease like cardiovascular disease, is really the paradigm of the individual level risk factor approach to

understanding of disease. And yet we see these very strong spatial patterning of a condition like diabetes in the order of a fivefold difference across New York City neighborhoods. So what explains—there's something very powerful going on that's spatially patterned that's generating these incredible differences. So what might explain that? And I'm sure you all have thoughts about it already. But one thing that comes to mind very quickly is—well first there is, and this ties in very well with some of the things that David was talking about. There is very strong residential segregation by things like socioeconomic characters and race ethnicity, which we know are very predictive of many health outcomes for a variety of reasons. So that's certainly part of the story. But there are also a range of environmental and place space features that may contribute and perpetuate these differences. And these are the things that I'd like to talk about. Of course these things are not separate. They are very close linked to each other. Because residential segregation affects the location of resources and services, because of differential power distributions, and advocacy, and a variety of structural factors that influence the placement of different kinds of environmental resources. And in turn, environmental features affect and contribute to residential segregation. So these things are very intimately tied and the question is, how can we break this vicious cycle? And I would like to focus a little bit on the part down here about environmental factors. So

this is an example that related to things that we've talked about this morning quite a bit which shows the location of food stores in Baltimore city. These are census tracts, selected census tracts, in Baltimore city and Baltimore county. And these are tracts in which participants in a large longitudinal study that we're working in live. And this is why we focused on these particular tracts. So the tracts, you can see that the shading of the tracts reflects the predominately black or predominately white; so predominately black inner city poor tracts and the suburban predominately white wealthier tracts. And the dots represent food stores. The larger and the darker the gleam of the dot, the higher the healthy food availability index of the store. This is a systematic assessment of what's available in these stores. And so what you can see here is clearly that the stores with larger healthy food availability are predominately located in the wealthier and whiter parts of Baltimore, whereas the inner city and poorer areas have lots of little dots, which are stores with very low healthy food availability, as assessed through the standardized instruments. So we actually audited the stores in our locations. And when you visit some of these stores, the stores look like this, for example. So it's not that there aren't any stores in these places. There are in fact many little stores, but they offer very little in terms of healthy food, as you can imagine. So as a follow up to this, we said how is this related to people's diet? So we had about a thousand participants living in these

census tracts and we measured diet through a very detailed food frequency questionnaire, and constructed two indices of diet, of the general quality of diet; an index which captures the intake of fats and processed meats, the higher the index, the more unhealthy the diet. And an index that captures whole grain and fruit intake, the higher the index, the more healthy the diet. And what this slide shows is that whether we measured healthy food availability around the participants: residents in their census tract, by the closest food store or by the average in the tract in which they lived. We saw that living in an area with a higher healthy food availability index was associated with lower value of the intakes of fats and processed meats and a higher value of whole grains and fruits. And we know that both of these dietary patterns are linked to a variety of chronic disease outcomes. So there's an association between the environmental feature and the diet. Now does this imply that there is a causal relationship? Of course we cannot conclude from these data, which are associational data, that there is a causal relationship. We need other types of evidence. However, it is compatible with a causal relationship and importantly I also want to point out to you that obviously there will be bidirectional relationships here in terms of what's offered. What people buy affects what's offered and vice versa and I'll come back to that in a few minutes. But regardless of whether this relationship is casual or not it's undeniable that a person living in an

area with a very low healthy food availability has a poor diet and if we want people to change their diet it's going to be extremely difficult for them to do it because of the environments around them. So even a very motivated diabetic is going to find it very difficult to change their diet in this environment. Will some of them do it? Of course some of them will do it because they have other resources or they have special motivation or they were fortunate enough to have a series of early life experiences which gave them the cognitive skills and the ability to overcome their environments but many people will not. And so that will contribute to some of the special patterning that we see. Now, I just showed you this example of pathways from healthy food availability to diet, potentially to chronic disease—whoops, this is horrible, you can't see. Oh you can see a little better. I had two versions, I wasn't sure which one was going to work. So here you can see that there are a number of different pathways and I'm not going to show you data on these but there a number of different pathways for which the physical and the social environments of neighborhoods, and I've listed a variety of attributes here which we've touched on today, accessibility of recreational resources, transportation, land use, the foods, advertising, noise, air pollution and also features of a social environment, safety and balance, social support, social norms. Which may operate through a variety of more proximal lifestyle mechanisms, and biological progress[?]. So there are clear pathways and

we have at least, observational evidence that suggests that some of these pathways are maybe operating. Now, I also want to indicate that while we try to separate these things out analytically, of course the physical and the social environment are very much related because we know that physical changes in a neighborhood, opening a public space for example may change people's access to recreational facilities but also is likely to change the nature in kinds of social connections between people in a neighborhood which may have other kinds of consequences for health. So some of these environmental features operate in a very synergistic and interactive way and isolating them is very artificial. Now when we actually measure some of these attributes specifically there are not only related cross sectional at a single point in time to behaviors but if we construct a healthy food access index for the neighborhood or physical activity index based on a variety of special measurements that we do of neighborhoods. We see that having greater access to healthy foods and greater access to physical activity is also related to reduced incidents of diabetes over time. So over a longitudinal setting, prospectively we also see observationally these relationships. Now this is observational data and so there are some limitations to it as many of you know. So to conclude I want to emphasize a few points. One is that there is clear evidence, I think this is undeniable that community in neighborhoods differ markedly in a variety of physical and social features. There's

overwhelming evidence of this. Many of these physical and social features have been shown to be associated with health observationally and I think here I want to emphasize that I think it's important to remember that in looking at the impact of places or environments on health, we're not looking only or perhaps not even predominantly at causation in the classic sense. No one, be very naïve to think that opening a food store, increasing access to healthy food is suddenly going to change everybody's diet. That's not the way the world works. But we have to think of these environments as also facilitators of the actions of other causal factors and so they have to be present for other interventions that focus perhaps, on individuals to be effective. So it's not just, or even predominantly about causation in the classic sense. It's about facilitation and it's about synergism. The other thing is of course, the many bidirectional relationships that go on in which the way that individuals related to their neighborhoods and their environments. What's in an environment affects people within them and what people do in their environment affects their environment. Some of you who all work in community development know this very well. These relationships are bidirectional, they are synergistic, they are dynamic. So the question is, where do we intervene? What's the best place to intervene? And so far I would argue that at least from the health prospective, we have been intervening almost exclusively on the

individual, trying to motivate individuals to change. Trying to incentivize them to change on an individual basis and that has not been very successful. So we also need to look at the other part of the equation which is the environment. And it's challenging, it's difficult but I think it's something we have to seriously grapple with. You know, it would be great to have a randomized trial I think, for a number of reasons and I'm sure we'll return to this in our discussion. I think it's unlikely that we are going to get randomized trials of some other kinds of interventions that we're thinking about. The kinds of problems that we're looking at are very different from identifying whether a particular drug works and I know there are trials of social interventions. Nevertheless, I guess I wouldn't wait for it. I think it would be—I think it's unlikely that we're going to have randomized trials in the near future of some of these things. So the question is what do we do? Do we say well, we can't do anything because we don't have a randomized trial? There are also many limitations to randomized trials which we can get into if we have time in the discussion. So from my perspective and I think we have to do what makes sense, because common sense is an important guide still, even in academia and sometimes and so I think—I think we have to act based on best available evidence as we have always done. Now we have to rigorously evaluate that action. So if we act to change communities based at least, based on some of the health evidence and the many other



reasons that we may want to act on communities that have nothing to do with health and are just as important. But if we act based on some of the existing health evidence than we have to be prepared to evaluate that so that we can figure out what works and what doesn't work. And that's complicated but I think there are ways that we can do it. And also, in parallel to that, I think we have to really think seriously about evaluating health consequences of a range of changes that are going on in communities for reasons that have nothing to do with health and I think we can learn a lot from rigorous evaluations of those kinds of changes so that we can have better evidence on which to base future policy. And key to these things, you know, the reason why I think we have to do this is precisely because we're working under context of systems and interventions, you know, the changes that are happening could have impact on a variety of different pathways because of this systems nature of place based differences in health and so we have to be prepared to be able to measure some of those multiple different kinds of outcomes. So key thing is thinking about you know, we're really working under the context of systems and in order to be able to do this I think partnerships between researchers and between community development people are really key because neither of us on our own. The scientists even from the point of view of obtaining scientific evidence, we will not be able to go much further unless we do that, even from the point of view of scientific

understanding purely and I think from the point of view of community action, community development, this kind of information is invaluable in order to advocate for policy. So thank you very much.

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