16th Annual MCH EPI Conference: Plenary I — Social Determinants of Health: How Far Have We Come in the Past Two Decades and Where Do We Go from Here?
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WANDA BARFIELD: Okay, good afternoon and welcome to this afternoon's plenary presentation titled social determinants of health, how far we've come in the past two decades and where do we go from here? As the moderator for this session, I would like to provide some context on the topic of social determinants, why we're discussing it here and now and introduce our honored invited experts. So what are social determinants? They're the conditions under which individuals are born, live, work and eat. What about resources? Resources driven by economics, social politics affect these conditions and those conditions impact health inequity. In response to increasing concerns about persisting and widening global inequities, WHO established a commission on social determinants of health in 2005 to provide advice on how to reduce them. The commission's final report disseminated in August 2008 contained three overarching objectives. First, to improve daily life. Two, to tackle the inequitable distribution of power, money and resources, and third, to measure and understand the problem and assess the impact of action to include policies and programs and how they motivate change. So what is the impact of social determinants in the U.S. Assessment of the true impact of policy change is necessary in order to influence social determinants and reduce health inequity. Evaluation of focus intervention and use of evidence-based intervention will inform states, local alts and agencies and how is it measured? It is possible to get the individual level data to the surveillance data. The life force perspective is an integral part of this concept. So you may say why here and why now? Well, in part because you asked for it. These tribes, localities and territories want and need more than the medical model to understand the underlying causes of health inequity. We listened to many of you attendees from last year's conference feedback and promote the work of MCH professionals dedicated to this work with a clear understanding of measuring the concepts and implementing, amending and

monitoring programs with the focus on measuring impact, CDC, through our partners with The National Center for disease prevention and health promotion has a Congressional charge to measure social determinants of health through the upcoming FY11 community transformation grant. These grants will be awarded to communities to improve the health of communities with a focus on reducing disparities through equitable health-promoting policies. In the realm of Maternal and Child Health this can mean working with community leaders to promote more green space for exercise, creating hospitals that are baby friendly. Promoting the participation of fathers in maternal child held. The Division of Reproductive Health which is in the center, supports the measurement and evaluation of this concept, the technical assistance in these areas as well as using data such as program for surveillance and evaluation. Our panel of three experts will now discuss the issues of social determinants of health. First is Dr. Lisa Berkman, Thomas Cabot professor of public policy, epidemiology and global population health at Harvard University and director of the Harvard Center for population health and development studies. She will provide an overview on social determinants of health. Dr. pat owe Campo, professor of the director of center on inner city help will speak on comparing community levels and finally Dr. Richard David, perinatal epidemiologist and co-director at stronger hospital at Cook County, Illinois. He'll speak on the practical applications of social determinants of health measurement in the real world context. He will then discuss his current work on trans-generational poverty among African-Americans. Please join me in welcome our distinguished guests. Thank you. [Applause]

LISA BERKMAN: Thank you, it's a pleasure to be here today. It's an especially enormous pleasure because up until about a year or two ago I had absolutely nothing to do with Maternal and Child Health. Most of my career has been looking at how social conditions influence adult health, especially processes of aging. However, the last couple of years I have seen the light, probably you'll all have already seen the light years and years ago, and have come to recognize the importance of Maternal and Child Health issues but also what I'm going to talk about today is the ways in which we share a common agenda and how important it is, I think, to understand the ways in which that agenda is really shared and what the consequences are of not having a shared agenda when we look at the ways that societies are undergoing a lot of demographic transformation. Let's see. I'm going to talk to you today about a series of demographic changes which, on the surface, seem really disconnected except that I think they lead us down a joint path to thinking about a whole set of institutions that need to be reorganized and kind of fall in line with the sorts of transitions that we're having. So there are more women in the workforce, not only in the United States, but across the entire globe. There are more dual earner couples in the United States and also in most other countries. There are lots and lots of older workers, as life

expectancy has increased, the amount of time that people stay in the workforce has increased for a number of reasons. And there is growing diversity in the workforce. Now, all these things are really good. People usually talk about these as like problems. Well, these are not problems, these are actually the fruits of our labor like we've all worked really, really, really hard to bring about all of this in terms of rights and opportunities and increases in health and longevity. So these are all good things. It's just that what has happened is that they challenge us to reform and kind of change the way institutions, particularly work I'm going to talk about, needs to be reorganized so that all of this transition can lead to the kinds of benefits that we would like to on a societal level. I'm going to run through that a little bit quickly for you and just show you what these demographic changes look like. Either the data on women in the labor force, if you look at 1940, when we made most workforce policies, about 10% of women with children 6 to 17 were in the workforce and very few people, less than 5% of women with children under 6 were in the labor force. This has just changed dramatically over time and now it's about 80% of women with children are in the workforce. So the way that we think about work as if this is like this little momentary blip where maybe people have a baby and they come back to work is a fantasy. People are going to be in the workforce, men and women, for a very long time with any number of children. So low fertility and increases in life expectancy lead to continued population growth around the world and I want to embed part of this in this larger agenda because, in fact, we often disconnect them and, in fact, some people have really urged us that this is like a win/lose situation. If we invest in old people young people will lose out. If we invest in young people, old people should sort of take the ice flow and gently ride off. And personally that's not something that I think anybody really wants to confront. Like we should be able to deal with this as a win/win and part of the issues are we make that combative instead of understanding. So I want to run through this just a little bit. Many of you will know it. So this is population pyramid when it looked like a pyramid in 1960 when people talked demography. This is the number of people in developing countries in the lighter color and in the darker core here are people in developed countries and you can see it is what we learned about in school books. This is what it looks like in 2000. Not exactly a pyramid. In fact, it's this growing rectangularization and if you look at what is happening in developing countries, you can see this is not a pyramid at all. It looks more like a boa constrictor with a mouth sort of getting eaten and I don't know where you fall exactly. I can tell you I fall exactly where the bulge is. And this is what things are going to be like by 2040 in the world globally. So this is a complete rectangularization. It threatens what we think about in terms of dependency ratios and it is a really good thing. It means people are living for a long time and for those of you who notice this little top, somebody once referred to this as like the mushroom cloud of older people over all of us.

The over 80 group will be the largest group in developed countries. So we can't afford to hide about this. I think we need to think about what are the consequences of this. The other thing that happens about this is that it changes the structure of societies, right? When you have lots and lots of old people, many fewer young people, across everywhere except the only places that have still high fertility are in Sub-Saharan Africa and those are changing over time. You start to get dependency ratios that are completely unlike anything we've seen. So we're used to looking at this as the number of people under 5 globally. I think this is about 1960, this is the number 65 and over. This is actually about 2010 or 15, somewhere right in here. There are across the globe, never mind EU countries and the United States, more people over 65 than there are under 5. It's staggering when you think about this transformation. So we have to think about how this relates to how we design work, how we think about dependency, how we are going to take care of each other, how families are constructed, how siblings, which are now often multiple in a family, are maybe one or none. And what this means. It is going to be a huge, profound change. The third demographic trend is something, again, that most of you know, which is that in the United States we become increasingly diverse so that right now about 69, 70% of Americans are white but by 2050 that number percentage falls to about 50, with large increases in the Hispanic population and some still increases in African-Americans and an increase in Asians. So as we become more diverse and think about what immigration is going to do, it again threatens how we think about family organization and how people are going to manage to work if they have grandmas back in their country of origin or if they're across the country or if they're a single parent. So throughout the world women are in the paid labor force. And we have all these demographic trends in terms of aging. So what would it look like if we all pretend it is not happening? Like we're just going to go home and ignore the whole thing? It's very likely that these demographic transitions will cause rising inequality. One of the things about having lots of old people is that they're often more wealthy in part because of Social Security but they often have more resources than young families. It creates very fragile families and communities. It creates new urban areas where it will be very difficult to catch up quickly, and here I'm talking mostly about in developing countries there will be environmental consequences, there are real threats, I think, to how we think about integration and who will become socially excluded and under the worst case scenario, there could be increased conflict. This is sometimes framed as between young and old but because young and old is also economically and racially and ethnically patterned, it could lead to a lot of tension so we need to pay attention to this. I want to spend a minute talking about inequalities in health across Europe and then I'm going on the United States and then I'm going to talk about what I think is part of the solution. So we've done some analyses building a lot on the work in collaboration

with others looking at data and mortality in the U.S. over a long time and linking it to the national health interview survey and I'll keep going. In Europe today they are quite comparable so that mortality data are linked to either census or large survey data over time and we've looked at inequalities across countries for men and women 30 to 74 years. And we've separated these analyses by gender. So these are mortality rates per 100,000 by levels of education for men. And what you see here on the white bars are people with the most education, the red bars are people with the least education and here is the United States ranking in terms of the highest level up here and here U.S. Black. So if we think of this as the one level where the U.S. all is, you can see the enormous variability over time and where we rank and really the only countries who have higher levels of mortality for people with the least education are Eastern European countries, Estonia, Lithuania, Slovakia, countries with whom we hardly ever compare ourselves. With regard to women, actually women rank somewhat more poorly than men do and, in fact, part of what has been interesting over time is that life expectancy for women in the United States has not stagnated, but lost ranking compared to other countries worse. So women are actually doing worse than men comparably in terms of these country rankings and here you see the U.S. as the third country ranking here. U.S. Blacks having the highest levels of inequality with countries like Estonia and Hungary and the rest of the world. It's striking what we're doing. We've often thought of education as one of the prime movers of this level of inequality and that we need to invest. In fact, Americans are very well educated and have higher levels of certainly upper secondary education than many other countries. So we have to start looking at other kinds of things. So there are a whole set of usual suspects. I'm not going to talk about any of them. What I want to talk about, actually, is the relationship between work and family conflict. Because I have an idea which I've sort of said is half baked, not meaning that it's completely ridiculous, just meaning that it's just halfway close. It's in evolution that part of what has gone in the United States over the last 50 years is that women have joined the workforce in huge numbers, more than almost any other country. That fertility has remained relatively high during this time compared to EU countries. Not really, really high but not anywhere near what most of Europe looks like. And we have almost no social protection. So when you put those things together, you kind of get this perfect storm that bears down not only on the well-being of women but potentially on children. And that's why it's actually such a pleasure to be here today and you can tell me if you think it's half baked on the good way or the bad way when we come to questions. So let me keep going now. And actually talk about why the U.S. would have larger inequalities. There are a lot of hypotheses including why, you know, European tax systems are more progressive. Healthcare access is something we always talk about and my European countries have social policies designed to

compensate for poverty. I would call these the usual suspects. And I think they're important. I don't want to actually say they are not important. I just say what is striking is that like work and family isn't on this list exactly except in the social protection category. So this is the idea that high demand in terms of work and family, low control, especially if you are -- come from lower economic position, and low levels of support both in terms of informal support and formal support create low population health and actually serve to increase inequality. That is, at least, the idea and I'll show you some of the data for that. So this is weeks of parental leave between 1981 and 1999. For a lot of different countries, I don't know if you can spot the United States. It's a little bit hard. It is because it's zero at 81 and zero at 99. So we are like out there as one of the very, very, very few countries that don't have Federal policies with paid parental leave. We have FMLA but not paid parental leave. Other countries over this time have not only had parental leave but increased the length for many cases. That's one thing. These are data from Jodi Heyman who wrote a book called the widening gap looking at the kind of normal flexibility benefits that many workers have. She looked at sick leave, lack of vacation leave, lack of both sick and vacation leave and the percentage of people who have two weeks or less of sick and vacation leave. And looked at that by working families and what she found was that 84% of families in the lowest income had no -- had less than two weeks of vacation and that 41% of others did. So as you look at this, you see the best people -- I'm sorry, the best off people are doing better than the worst off people. So 40% of the upper core tile is still not having sick leave is not a great thing but when you look at people at the bottom file it's pretty striking. So we need to create policies that maintain families and labor source participation and don't permit women to drop out of the labor force because it's so hard to be able to balance this and we need a set of policies that are a win/win not only for working mothers, but for all of us over our life spans. So when you think about older workers as they start to take care of partners who become ill or they have chronic illnesses or people who are taking care of their parents, it becomes a huge, huge sort of issue. And for those of you who have had children and thought zero to 1 was the easy part, almost nobody thinks that, right? Like try to figure out what to do with an 11-year-old or a 13-year-old when you're at work. In some ways it's far more challenging. So the idea if we only had parental leave for this little, you know, little crisis moment at three months or six months we would fix it is -- doesn't do justice to the kinds of balancing that people do through their whole entire life. That come and go as people confront normal kinds of crises. So all of us are going to experience the death of our parents, the illness of partners and siblings, and of young children and close friends and the idea that we don't have a work policy that can adapt to that in some way doesn't actually lead to a very productive workforce. It means that you are losing a lot of people who would be enormously productive

if they had a little flexibility. So I'm going to show you the very beginning of some work that we've done on the health impact of work/family demands among employees in long-term care and some other studies. In this study, we've actually been working for about three years on a network that is funded by NICHD and NIA on work/family balance and looking at the health impacts of work/family balance. In this network is made up of our site and Portland State and Penn State and Minnesota and Kaiser and RTI we've developed a series of pilots to look at how work/family balance might help health outcomes and we're also very interested in doing a long term randomized control trial which we're just in the middle of and I am not going the talk about today because we haven't even done the baseline interviews but I'll mention it a little bit. So I'm going to present data from our pilot study for nursing homes in which we surveyed low wage workers, mostly CNAs and nursing assistants. Some nurses and people in cafeterias and janitorial work and also interviewed their managers so they were all interviewed. They had a manager that was a mid level manager like a nurse who often supervised about ten people and looked at the relationship between the nurses' responses to how they dealt with work/family issues for which there was no great policy. Just how did they creatively balance that sort of thing? And what was the association between the managers and the employees, cardiovascular risk and sleep? And here what we show you is the relationship between five cardiovascular risk factors and what we did was measure hemoglobin in bio markers, cholesterol and then we assessed tobacco consumption, obesity and blood pressure. So these are all directly assessed cardiovascular risk factors looking at the odds of having two or more of them by how kind of great your boss was at being creative and flexible. And here you see the bosses who were the most flexible are the reference group. They have the odds ratio of one. People in the mid who had managers who scored in the mid range and low, that is had a risk of over two-fold of having two or more cardiovascular risk factors and these are not self-reports of the managers. We interviewed the managers, we did actually qualitative interviews, had them coded and what we did was look at the association between their reports and how they behave and their employees' risk. The second thing is that we looked at the manager's score with sleep duration. This is the really scary one because we actually measured sleep by looking at -- we put -- we gave everybody a watch monitor and they wore it for seven days so we had objective indicators of sleep duration. Some people we couldn't even measure sleep, like the largest amount because they were getting it in two hour snatches. But here you have the same kind of thing that managers who were the worst managers, the least creative and open, had employees who slept about 6.6 hours a night compared to over 7.1. So it's almost a 30-minute difference in sleep between having a manager who is open and creative compared to a manager who is not. So we think these are really intriguing, not randomized, we haven't done the study yet but

this kind of flexibility has the option to be health promoting, not only for employees, but for their families as well. And the next part of this study is actually a randomized intervention aimed at improving employee, family and workplace health. We're partnering with Penn State measuring the kids and the partners and we're partnering with other groups who do work organization because the idea in these long-term care situations is that they actually think that they are losing workers all the time because of work/family things. So we think this is potentially a win/win for the company, for the families and for the employees. And we will see what happens. You have to stay tuned for a long time, unfortunately. But we're really curious to see how it turns out. I thank you very much and look forward to hearing your questions. [Applause]

PATRICIA O'CAMPO: Good afternoon and I'm really pleased to be here to talk about one of my favorite topics, health inequities and reducing health inequities and I'll be talking about issues related to methods and research strategies. Here we go. So I hope to convey the following key messages during my talk. First, very briefly I'll focus on the issue of health disparities. The fact that they are growing and that they require immediate attention to reverse or to eliminate them. And also currently epidemiologic research is not doing a great job. It is generating too little evidence to inform the design and implementation of effective programs and policies to address inequities. And finally, the methods and scopes of epidemiologic research has to change. In particular we need to adopt brain work that more accurately reflect the social determinants of health. We need to focus more on the full set of social determinants of health to inform solutions and we also need to recognize and embrace this notion of complexity at multiple levels. We have a lot to cover so let's get going. Very briefly, about the issue of inequities in health, I'm sure you've all seen a lot of data that looks something like this. These are data on disparities in low birth weight by race and education and you can see what you might expect to find. That in fact there are differences across racial groups, some experiencing higher rates of low birth weight and some lower. And it will probably take a whole lot of targeted work to get some of these groups down to the levels experienced by those who are the best off in the group. You can think of practically any health indicator and you'll probably see very similar data where there are disparities by socio-economic position and race. In fact, that's what the WHO commission did when they released their report in 2008 on closing the gap in a generation. They demonstrated that, in fact, inequities are pervasive across the globe. But if we think about it, the data on disparities are really not that new. We've actually been demonstrating disparities for several decades and, in fact, too often when we focus on the gaps, the gaps alone don't really point to what needs to be changed in order to implement effective solutions. So what I would like to do is talk about what kinds of evidence epidemiologists need

to generate in order to close those gaps. One of the first things I would like to do is to think about sorting our epidemiologic research into two types. So research on disparities need to be problem-focused. We can focus on identifying the problem, describing the problem. Epidemiologists do a really good job of that and looking at the magnitude of the problem and the social determinants of health. That's problem-focused research. Contrast that with solution-focused research that is different. It's the solution-focused research with need to inform the intervention. We have mechanisms of the social determinants of health. By that I mean how the social determinants of health relate to either adverse outcomes or risk factors for outcomes. Really, the causal pathways. Evaluations and program tailoring are obvious solutions. Focus research examples and even evidence syntheses. That's increasingly becoming important so we know what some of the best practices are. I'll be talking a lot about what we need to do to generate more solution-focused research. As epidemiologists we're very well trained to do problem-focused research and not enough solution-focused research. I'd like to focus on whether we're using the right framework to inform research on health inequities. I'm sure everybody here is familiar with the kind of biomedical disease etiology models pervasive in health and epidemiology. You take several risk factors, I've just picked these at random, health behaviors, age, environmental exposures, etc. We often determine whether they are associated with a single outcome like pre-term birth or another study might focus on these factors in relationship to smoking. Another study might look at diabetes, etc. So that may be fine when you are really interested in looking at just pre-term birth and what the risk factors are. If what you're interested in is focusing on the consequences of, say, low income or poverty, in fact the disease etiology or biomedical model isn't the best candidate for doing that. An alternative to that is something called the social consequences model and we can contrast that with the biomedical model because the social consequences model recognizes that something like poverty doesn't have specific effects to a particular disease outcome. So it doesn't, for example, just cause cardiovascular disease or obesity. It increases the risks of all of those things and there is varied effects. One individual might become depressed if they're in poverty. Another individual might experience cardiovascular disease. Another individual might have four of those. So we need an alternative way of looking at social determinants of health when we do our modeling. So what difference does that make? We did an analysis where we tried to compare the biomedical model to the social consequences model and I'll show you what difference that makes. We used a national sample from Canada looking at adults from the years 2000 to 2005 who participated in a survey and we focused on adults who were under the age of 60 because we didn't want everybody in the sample to be sick with age-related conditions. There were about 80,000 individuals in our sample. And what we did is we

actually took every single one of those factors and we looked at them separately. So we looked at using the biomedical model. The obesity separately from the diabetes, from the mood disorder and we focused on socio-economic positions. Individual level income and education and neighborhood deprivation. And we compared, then, each of those, looked at through the lens of the biomedical model to using a composite index. So a composite health outcome, then, collected data -- used the information on all of those. So if you had any one of those and you were in the disease category. I can't show you all the results because it would take a long time. I'll just compare just obesity to looking at a composite index and you can see what difference it makes. So if we just look at obesity and again this is the biomedical model. Relating socio-economic conditions to obesity we can see the trends that we might expect to see. First if we look at income, we used the highest level of income as the reference group. We're comparing those with under 35 and income of under 35,000, those with 35,000 to 75,000, to those with greater than 75,000 a year income. And these are the odds ratios and the confidence intervals and we see what we might expect to see. The odds ratio is higher for obesity among those that have the lowest levels of income. I should say that, in fact, all these variables, all the socio-economic variables and gender, age, marital status and visible minority status were in the models. We see a similar pattern with education where the highest level of education is used as a reference group and the odds ratio for neighborhood deprivation is 1.09. The actual values themselves aren't that important. Let's see what happens when we compare the biomedical model with the social consequences model. There we didn't just say 1 and 0. 1 if you had any one of those and 0 if you didn't. We created a bit of a gradient. We looked at two, three or more conditions. In blue is looking at the composite outcomes. We can see quite quickly that, in fact, when we look at the composite outcomes we see stronger gradients. Rather than 17 and 12, we see 13 and 19. When you have three or more conditions you have odds ratios of 1.6 and almost 3. We have stronger gradients. It's not just because we have more conditions in the composite. Although that's partially driving it. Part of the issue is when we look at obesity, those with obesity have a code of 1 and those without obesity have a code of 0. But the folks who were in the 0 category may have some of the other conditions that are very much driven by experiencing low socio-economic conditions. So they may have cardiovascular disease or they may have depression, they're just not being counted in that model. So the biomedical model tends to underestimate, as we can see, the impact of low socio-economic position on outcomes. So as I mentioned, the biomedical model tends to underestimate the impact of the social exposures. When we looked across all of the range of health conditions that I mentioned to you and compared it to the composite, we saw the underestimates going from about 40% to about 85%. The social consequence

approach is the more theoretically consistent and actually more accurate in measuring the impact of social exposures on well-being and we should think about such models when we're looking at social exposure not just socio-economic position but things like housing, social policies, neighborhood environments. When we're interested in the social consequences, social exposures, we should consider using some alternative models and not just relying exclusively on the biomedical model. So I'd also like to encourage us to look further than just the individual level risk factors that we tend to look at in epidemiology. We do a pretty good job of looking at things like behavior characteristics and cultural characteristics and economic characteristics but we don't do such a great job of looking at more upstream factors. Occupational or environmental policies and even the political context. I looked at three years, the last three years of studies in PUBMED and about the thousand or so articles I found there were only 25 that dealt with factors that were more upstream. So again, we have to balance, in part, because it is those upstream factors, the policies which are going to drive the distribution of those characteristics which are more proximal to the outcomes that we're interested in. And this kind of data is very important looking at some of those political factors. I can tell you a story that I experienced right after I graduated. I was working in Baltimore, Maryland, with some of the original Healthy Start sites. That dates me there. I had just graduated and I was working in Baltimore. This is a picture of Baltimore, not necessarily a very pretty picture of Baltimore in this map of Baltimore, we see there is poverty and this by the way is from the 1990s. Quite high levels of poverty in downtown Baltimore. The brown areas, for example, represent neighborhoods where anywhere from 45 to 77% of families live at or below the poverty level and even the dark orange areas represents neighborhoods where between 27 and 45% of families live at or below the poverty level. So there is neighborhoods with lots of social and health problems. Complex ones at that. At that time Healthy Start was able to get quite a bit of money, so the first site got somewhere around $10 million a year to be able to focus in concentrated areas within the city. And so the -- actually mobilized several sectors to come together. And the program designers, the city health departments were quite innovative and wanted to go well beyond healthcare although they did focus on healthcare and they wanted to focus on several upstream determinants of health. Housing, employment, social services, healthcare and being the researcher on the team, they turned to me and I was quite excited. I was a new graduate and I was kind of living that question that everybody gets in their dissertation defense. If you had a lot of money, what would you do? Here was a situation where there was a lot of money to be spent and we were all counting on research to really say well, which one of these factors is really a driver in lowering infant mortality. We had to cut infant mortality in half in five years. Which one of the factors was most important or combination of factors

was most important. How is housing or employment related? The sad ending of the story is the research didn't tell us the answers to that. I know it is going through your mind. That was a long time ago. 1990. Fast forward 20 years, by now we really should have the answer to this, right? We've been working on this for 20 years. And I think you probably know the answer, that we do not know what the answer to this question is. It's like knowing what the question has been for 20 years. -- despite knowing what the question has been. We focused very much on the problem area or problem-focused research. We haven't looked at the mechanisms by which some of those upstream factors relate to adverse health outcomes. And we haven't -- there is that imbalance again of problem focused research especially at the individual level and very little focus on intervention. So it's not just my opinion. In fact, in the UK they did a systematic review of all of the literature that focused on health inequity and they published it in 2002. A national health service and the Department of Health and they found that .4% of all of the research on inequities focused on interventions. .4 is not 40. It's less than 1%. So we really need to shift that balance towards more intervention-relevant research that focuses on the social determinants of health. So let me talk a little bit about this idea of complexity. Because when we do focus on interventions, they're not going to be simple interventions. When we're starting to look upstream, for example, we're going to see complexity because there will be multiple levels and we're also going to see complexity because we need to focus beyond just demonstrating associations between those in either health equity or health outcomes. We need to focus on the mechanisms and we need to figure out how is occupational environmental policy related to these factors and in the end related to those factors. It is going to be complex. So we've been dealing with complexity in the area of systematic reviews and I would like to share with you one study that we've done in the area of partner violence. I know everybody here is familiar with systematic reviews. They're certainly the strongest form of evidence that we can generate in order to inform policies and practices and programs. There are benefits to systematic reviews. They don't rely on one very well-known study. They summarize all of the data on a particular topic. And they're really great especially if the interventions tend to be fairly straight forward or are discrete. When you're talking about complex interventions or programs, conventional systematic reviews might actually be limited because it would be hard to summarize sort of the complex processes, say, into a summary statistic which you often get from meta-analyses, for example. And also when you think about the review of complex processes at multiple levels, it might be better to think about discovering how the programs work or why the programs failed. That's exactly what we did. We looked at the issue of intimate partner violence and screening for intimate partner violence in healthcare setting. There is a little bit of background there. Violence -- intimate partner violence research is

relatively new starting in about the 1970s. And because of all of the information that was coming out in the research, public health finally embraced the issue of partner violence in the 80s. And in the 90s, because of the information that was coming out about the prevalence of lifetime abuse, somewhere between 20% and 30%, there are a number of professional health organizations that called for universal screening and healthcare settings. And it's not really being done now. And some of it -- there have been a number of systematic reviews that have been done and they've all concluded there isn't enough evidence to support the universal screening in healthcare settings. We disagreed with them and we were also questioning the idea, sort of theoretical framework that they use to inform systematic reviews because screening for partner violence is not like screening for blood pressure. When you screen for blood pressure you have the cuff and the cuff isn't that controversial. You put the cuff on and you get the truth once you get the cuff and once you read the results and then you can intervene. Partner violence screening is not like that, although a number of the 10 or so systematic reviews that have been done assume you screen and violence should be reduced. In fact, there have been many strong statements that have been made, as I mentioned before, that there isn't enough evidence that screening is effective in part because I think they were using the wrong framework. In fact, screening is quite a complicated process. Not only do you have screening and then something has to happen for a woman to disclose and that isn't straight forward. It's not like the blood pressure cuff. After a victim discloses, then you have to go through a referral process, usually a complicated referral process with social and health services and then after you go through that cycle a couple of times, there might be resolution of the outcome. So it's really a complicated process and that has to be acknowledged when we're reviewing the evidence. So we rereviewed all the evidence that was presented in those -- or that was summarized in those systematic reviews and we did it slightly differently. We did a couple of things. First of all, we recognize you can't just go from screening immediately to the resolution of violence. So we focused really just on the outcomes of screening, which is really disclosure, because that process in itself is actually quite complicated. And we looked at the multiple level influences on screening and we also looked at how screening works. We really emphasized the theory behind screening more than just how many more victims were identified based on screening. And we used a process called realist review. Quickly in the interest of time realist review is good for complex interventions compared to conventional systematic reviews. It tends to focus on why things work, not just whether something works. There are multiple sources of evidence that can be used, not just the literature and the results of a theory or mechanism for how successful programs work or how they don't work. So I'll share with you the results, which again is not a summary statistic but a bit of a framework that works in multiple levels.

So when we re-evaluated the evidence, we found there was quite a bit of support for successful screening programs and these are the components of routine and universal screening programs that tend to be more successful. So they have several of these components. For example, effective screening protocols and high institutional support. There are several programs that picked one. Several programs introduced a tool in the clinic. It wasn't very successful. Where some of them said here is a protocol we should follow and it wasn't essential. You have to create a situation where the provider who is screening has high levels of self-efficacy and it tends to support the other components and tends to -- so we in our re-evaluation of the evidence, we actually found that there was quite a bit of support for implementing screening programs in healthcare settings as long as it follows this kind of a model. It is true there are many failures, if you just implement one or two of the components. This kind of challenges the ways in which the evidence has been summarized in the past. Your conventional systematic reviews. So we need to focus much better, then, on looking at the multiple determinants of health and also at more upstream factors because in many ways, it's these upstream factors that are actually going to drive the associations or drive the reduction or the increase in health equity as well as improvements in health status. I just want to share with you some data that actually came from Wilson and picket on this in case you're unsure about whether or not those upstream factors are driving the relationship. Here we have data from two countries. Britain and the U.S. and we're looking at changes in levels of inequity over time starting in the 1970s. You notice that 1970 it's 1. Everything is calibrated to 1970. And we can see that inequities have experienced sharp increases in both countries. There have been some periods of decreases, decreases and even plateaus in both countries and those have actually been linked to the parties that have been in power during those times. So it is kind of hard to ignore the fact that when there are steep increases there are conservative governments in power. When there is some decreases there is either labor or Democratic governments in power. So we need to understand the mechanisms by which those drivers of inequities are leading to health. So again we aren't doing enough of that. We recently did a literature review, a systematic review looking at some of those factors there at the upstream end and we found that of about 4,400 articles that we reviewed, only about 83 of them really focused on the pathways by which those policies and intersect poll seals are related to health equity. So to summarize, then. I would like to encourage us to really move more toward focusing on solution-focused research. I think we need to do a better job of generating that kind of evidence if we're to reduce inequities. I'm not saying don't do any more problem-focused research. We need to do some of that but we need to have a better balance. We need to think about employing alternative frame works and appropriate frame works to generate evidence, to reduce inequities. We

need to use approaches that acknowledge multiple levels of complexity especially when we're looking at the mechanisms by which some of these programs work. And only then with epidemiology generate strong evidence to close the gap in a generation. Thank you. [Applause]

RICHARD DAVID: Hello. And, well, I'm going to see if I can -- what was it supposed to be, a more practical direction? I'm not sure that's the case but a slightly different direction. I'm focusing on first the particular studies that have come out of our work in Chicago and then I'm going to pull back to a much more global perspective on how does all this relate to the world and politics in particular? It's hardly necessary in an audience like this to mention the basics that birth outcomes, like infant mortality, are the barometer of how well a society is doing and despite the focus of many commissions, blue ribbon panels, healthy America 20 whatever, the results have always been disappointing. Infant mortality has a glaring racial disparity. It is very high for a rich country and these disparities are widening. Perhaps not everyone is keenly aware of how bad White infant mortality in the United States is but it is worth pointing that out. In 2005 the lowest infant mortality rate in the world was reported from Hong Kong at 2.3 per thousand. The United States was 6.9. But if you ranked U.S. White infants as if they were a separate country the mortality rate was still 5.8 which would rank them 24th in the world. That's not a lot better than the whole country did at 29. That's an important detail in terms of talking about how we construct political consensus to move forward. Social determinants have already been talked about. The list briefly the more recently-described social determinants, things like neighborhood violence, domestic violence, stressful life events, perceived racial discrimination and even job strain is alluded to by earlier speakers are also now, I would say, established or on the road to being firmly established as causal factors. We tried to take a look at the impact of the social environment throughout a woman's life by constructing a trans-generational. I'm going to briefly run through a few of the studies we've done with this to show the sorts of insights that are possible despite the limitations of data that are collected in this country. The United States doesn't collect data, really, on social class, right? There is no social class in America. We're all middle class, right? But anyway, we've tried to devise a work around for that by linking to the census data. The crux of the trans-generational birth file we used is the linkage of birth certificates from infants that were born around 1990 to the birth certificates of their mothers that were born between 1956 and 1976 and both points, that is the maternal birth point around 1990s and the grandmother's environment are census data to get a lifelong picture of the mother's economic environment. This is just a busy slide with a lot of numbers to show you that I'm really an epidemiologist even though I'm a doctor. [Laughter] One of the first questions that we looked at is just how different are the neighborhood income experiences between White and

African-American women in Chicago area? If you look at their entire life span, not just at one point. And to do this we used this trans-generational file and we were able, by dividing all the neighborhoods in Chicago into four core tiles of income from the lowest to the highest and looking at each woman by the environment in which she was born when she was a baby and the environment in which she lived when she was an adult and having a baby, we placed each woman into one of 16 cells in the matrix and we did these separately for White women and African-American women with this rather dramatic difference. Now, these three dimensional bars represent here is the core tile of income for the neighborhood at the time that the mother was born and there is core tile when she grew up. So lowest core tile one at both points in time for White women is this very short bar here. Actually, .2% of the entire population of White women in the Chicago area. Now, when we move over to the other set of bars for African-American women, fully 29% of the women resided in the lowest core tile at birth and when they gave birth to their children. When we move to the opposite corner of the matrix. Living in affluence throughout the life span is only .6% for African-American women compared to 15% for whites. This demonstrates in one more way the qualitative difference in life experience between African-American and White ***. One of the next things we looked at was the impact in terms of low birth weight risk for both White and Black women when they are exposed to poverty throughout their lives. We find not surprisingly, that if you're always poor as a White woman you have a high rate of low birth weight and the risk is doubled from that of women who have never lived in poverty. African-American women, both of these numbers are higher but again there is a gradient. Now we notice the relative risk is not as much, 1.5. That's only half of the story, though. Because how does this impact the entire population? If we look at the attributable risk for the population on the White women, lifelong poverty accounts for 1.6% of total low birth weight. However, among African-Americans it's almost a quarter of all the low birth weight can be attributed to this exposure. Another study looked for evidence of fetal programming. That is so say adverse intrauterine environment for a female fetus express herself in childbearing when you control for her socio-economic status and other things as an adult. It turns out yes it does, indeed. So that if we take only mothers who -- whoops, I'm sorry. Only mothers who are affluent in their childbearing years, those who were born in poverty have a higher low birth weight risk than those -- those who are poor whose mothers were poor have a higher risk than those whose mothers, the grandmothers in the study were affluent. The effect is steeper if the mothers are only in the medium income category and those who are still poor, it's quite steep. Now it's very interesting that even among women who are poor when they are bearing children have a protective effect if their mothers were not also poor. And one final example and actually there are a couple more examples that

will be presented in papers tomorrow and the next day by my colleagues. But one other one that is already out there has to do with the weathering phenomenon. I'm sure most of you are familiar with the work that showed, as we found just in our population as well, that whereas the classical U-shaped risk curve for low birth weight with maternal age from teenage up to the 30s is not seen for African-American women, namely the lowest rate of low birth weight is the teen years and risk rises steadily throughout the childbearing years. Several investigators have shown that this steepness of weathering, of deterioration of birth outcomes where the accumulated social and environmental stresses is worse for some Black women compared to others, basically being driven by poverty. While looking at it now with lifelong exposure to or protection from low income, we see that yes indeed this is a steeper weathering curve for the African-American women who always lived in poverty but interestingly, those who were never exposed to neighborhood environments below the median income there is no weathering. This is a curve although higher in absolute level is in the same shape as white women. One of the questions I wondered about because of the title of this session, how are we doing and where are we going or something like that, was what happened actually in our population over this 35 years in the study between these two generations and we don't have anything too encouraging to report. The percent of African-American women in the core tile has gone up from 52 to 66%. There has been slight -- actually deterioration in the number of White women in the highest core tile but this makes sense if you look at overall trends in income in the United States population over the same time period there has been an increasing concentration of wealth and income in the richest 2% to 5% and deterioration for the rest of us. So to steal Dr. Beckman's title here, are we losing ground? It's my impression that we are. And why is that? Rose pointed out some years ago that we need to reorient the way we look at these social determinants and we have to look at epidemiology itself in a different way. Maybe instead of just looking for causes of cases, we need to look for causes of incidents. Why do some populations do worse than others? Nancy Krueger advanced our thinking in this area even further when she critiqued the web of causation in her article entitled "epidemiology and the web of causation, has anyone seen the spider." She points out that the focus of our educational process and our academic activity as epidemiologists tends to be very much tied up in methodology, multi-variable methodology and that's an advance over the simple germ theory. One agent, one disease model that existed earlier in the 20th century. But the web of causation still assumes in most -- presumes moreover biomedical solutions, not social programs. She says by excluding any sense of history or origins, the web spider discouraged epidemiologists from considering why population patterns of health and disease exist and persist, or change over time. In other words, her approach directs our attention to the social system itself as a

possible causal agent. Now, she is careful in her review of this area to go into some historical context. Why is it that epidemiologists in the last half century have spent so little of their theoretical effort on coming up with causal pathways and causal theories? One big thing for this is the chilling effect of post world war II, Cold War social discourse, McCarthyism. In that environment to look for social causes was almost considered socialistic and therefore taboo in public discourse. You have to remember that back in the 1960s, even civil rights activists were being investigated as likely Communist agents. Martin Luther King I think had a dossier in the FBI office. I would add to those reasons that Krueger suggests a third one, which is the worship of the double helix in the dramatic developments between the discovery by Watson and whoever that other guy was of the double helix structure to DNA and the structuring of the human genome in the last decade. Bio-methodology has been embraced. The report of the first drug tailor made for African-American heart disease and marketed as such with approval of the FDA by dill, the idea of being able to match alleged genome differences in certain groups with specific disease interventions offered the possibility of a huge bonanza for new specialty drugs that could be marketed to particular groups. So with the decline in social intervention, social programs, social support systems, you know, free lunch, etc. and the gravitation towards the silver bullet that would have a high profit ratio for the pharmaceutical industry that manufactures it, we've made the transition from the new deal to by dill. Now, I would also introduce another change in people's outlook. In the post Berlin Wall period since 1989, the accepted wisdom has come to be that striving to create a society that is somehow enshrines egalitarianistic principles and provides free access to education and healthcare, it's been tried and didn't work. Socialism was an experiment and it failed. Fundamental social change, this line of thinking would say, is neither possible nor desirable. Certainly it is not desirable from the standpoint of certain sectors of society. The redistributed function of the state taxing the rich and giving to the poor is not going to be popular among all sectors. However, it is instructive to remember a few things from the last century. One is that the first universal healthcare system ever introduced was not in Sweden, it was in the Soviet Union in the 1920s. It's also an important fact to remember that the fastest rise in life expectancy ever observed in a large population was in China in the three decades following their revolution. The most dramatic decline in life expectancy interestingly ever recorded in peacetime for a developed country was in post Soviet Russia in the 1990s and the fact that struck me when I was reading through WHO data before it was being reported in pediatrics was that Cuba had passed us in lowering their infant mortality rate in 2003. So why is social theory important? If social determinants are important and they won't be fixed by lifestyle changes or gene therapy, then to be logically consistent we're dealing with problems that are systemic and social origin and then we must consider

changing the social system. What sort of change am I talking about? Eliminating racism and sexism. Real life, equal opportunity, not just in a slogan but really universal free healthcare, free education through the university level and, of course, anybody in the room is thinking how are you going to pay for that? Well, maybe we could switch some resources from how geo political activity, which is very costly. I mean, having 149 countries around the world that are currently hosting United States military bases, that's called the Department of Defense? It's costly. We're talking about a budget in the trillions. Just a small fraction of that diverted to human needs would help. All of this sounds really pie in the sky but look at the last one. This is a direct quote from the WHO commission on social determinants of health. We should tackle the inequitable distribution of power, money and resources. Think about that for a second. If that's not a revolutionary proposal. Will that proposal from sir Michael be likely to be embraced? Or are we more likely to see the unfolding of further application of Milton Freedman's social and policy objectives such as the program of social dismantling that took place in chili after the government was overthrown by a general in the 1970s. I don't know. I guess the future is not mine to predict. But I just leave you with two quotes, well-known 19th century philosopher said that philosophers had only interpreted the world in various ways. The point, however, is to change it. And Frederick Douglas said, if there is no struggle, there is no progress. Thank you. [Applause]

WANDA BARFIELD: I would like to thank our three speakers for an amazing presentation. We're now near tend of our plenary session but I would like to take a few minutes for questions. If you have a question come up to the mic and frame a very brief question. One quick question I had is the issue of a solutions-based approach. It's very intriguing. The question is, how do we think again about some of the models in terms of modeling a solution-based approach in terms of trying to understand it?

PATRICIA O'CAMPO: The idea there is to really shift what we're doing to make sure that the research that we do links to the specific interventions that we're thinking about. Again, a really simplistic idea is if we just go on demonstrating gaps, that doesn't tell us how to intervene. So really thinking about policies and programs that we would like to implement.

[Inaudible question]

RICHARD DAVID: I'm not sure why I'm stepping up here. It's not like I have an answer to that. [Laughter] No, I'm not sure about the -- you know, the details of that framework. It sounds perfectly logical but the problem to me with a lot of these approaches is, I do think a lot of people have a lot of ideas about what to do and how to move forward. But in terms of the way these decisions are made,

sometimes we use the term empowerment, but, I mean, that sort of suggests there is some benign force up there passing out power. That's not the way it works. Power is fought for. It is seized. It is organized. It's developed. And to me if there were one thing that would allow the majority of the people in this country to actually once again make some attempt at having influence on the ruling of the country, the main thing would be to overcome racial divisions in the populous and electorate. That means moving away from identity politics towards class solidarity if you would accept the term. The vast majority of people except the most wealthy and powerful in the country have disadvantaged to their health and various other parts of their lives because of, you know, bad policies like healthcare is the most flagrant one. When they take the polls it sound like they want the pharmaceutical companies and insurance companies to be rich. We really want that and for us to be uninsured. If you don't jiggle them that way. 2/3 of the people wanted single pay or something like that. So how do we make this happen? I think the first thing is we have to understand that health disparities are not a minority problem, they're a majority problem. That's I think the particular message that we as epidemiologists and teachers have to get out to the general public. And that will be a stepping stone towards building the political solidarity necessary to get the demands for what we need.

WANDA BARFIELD: One last question.

QUESTION: My name is John with the local San Antonio health department. Perhaps the reason why you don't have the solutions-based analysis has to do with funding. There is a lack of linkage between data and program management. We'll get a grant, we'll hire people, we'll spend the money, and perhaps we'll evaluate it if there is any money left. But we're not going to invest in understanding what we do before we do it because we already have good evidence that it worked in D.C. It might not work in San Antonio, but, you know, there is no money to spend the time to make sure that we're investing the money appropriately that we're going to get the intended outcomes and that, you know, it's a matter of the policies that we have to work with that could be changed by the CDC and the funding organizations in order to be able to get the desired outcomes.

WANDA BARFIELD: So again I think what was said particularly in Richard David's talk, there is this issue about allocation of money and where it's distributed. But I will say, you know, as part of CDC's effort in learning more about this presentation, as well as learning about the organization that I now serve in, it actually has a social determinants model with SES at the base and these policy issues at the base and I think it's at least a very important first step. It is actually, I think, refreshing that there is some interest in looking at the policy-related issues but understanding there are still challenges. And I think one of the

things that we may need to think about and I would love to hear from our panel is, you know, how do we maybe rethink our training? Because, you know, it's like risk factors, a particular disease, let's control everything over here so we can get a direct line. That just doesn't work. So it would be great to also maybe think about a dialogue in which we can really maybe rethink our approaches.

LISA BERKMAN: Say a few words about rethinking approaches because I think it's really critical. One of the things that I think happens in graduate school now is people get really, really good at analyzing data in very large datasets without ever trying to intervene or develop an intervention or test an intervention and see whether it works even if it's little ones. So I think we need to emphasize that kind of go into the field and do something and see if it works sort of model a lot more. The other thing is, I think that there is a new population science kind of evolving out of many, many fields and it is very exciting. I draw often, and I think our students increasingly draw on not only epidemiology but economics and demography and social sciences more broadly where there are models of evaluating policy changes and very good methods for evaluating policy changes. So I think we need to maximize that kind of training and kind of withdraw a little bit from having our students be really, really, really savvy at the statistical sort of modeling but really naive about tackling the problem.

PATRICIA O'CAMPO: So I, too, agree with everything that has been said in terms of what we need to do in terms of maybe changing the funders' ideas of what should be funded and also training. Let me just say that maybe in response to the questions, we're actually doing some case study-type research to compare countries which have successfully implemented programs to reduce inequities. Now before you turn your nose up at case studies like I did, there are newer methods to really look at -- rigorous methods to look at explanatory case studies. You can test hypotheses. Along the lines of training, we have a few -- I haven't seen many of these. Post doctor at -- we have several partnerships with community organizations and partners where we partner on evaluating their programs, for example or jointly looking at policies using some of the newer methods to address complexity like I showed you with the realist review. It's a two-year program where essentially they bring skills with them because they have doctorates, very trans-disciplinary but learn to apply the tools to looking at solution-focused research to generate strong evidence and they have to actually work with policymakers to make sure that evidence is taken up. That's key. We can generate evidence. If the evidence isn't used it is going to sit on a shelf or be in an academic journal and not used. It is important to think about training differently and there are a number of ways you can do it.

WANDA BARFIELD: Just again, there is the possibility through looking for example through community transformation grants which are really the opportunity to integrate policy and also to look out of a health systems model for promoting health. I think that's something important to consider. At this point I would just again like to thank these amazing speakers for really helping us to think and challenge us to think in new ways about trying to address disparities in health outcomes. Thank you very much. [Applause] At this time I would like to just announce that we have our student mentoring session so in your brochure you'll see the location and I would encourage everyone to attend. It's a wonderful experience for both those who are new to the area as well as those who have experience to share. Thank you.